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THE MACDONALD JOURNAL

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This Issue

Professors B.R. Downey and J.F. Hayes join forces to bring us exciting new developments in "Embryo Transfer and Other New Technologies" on
Should a dairy farmer keep a bull on the farm or rely solely on AI? Our thanks to Mr. Moreau for his article in which he says... there is no choice
This is the time of year that Stuart Bowman's article should make for important reading
Low quality or quantity forages getting you down? Read Professor Elliot Block's article on
Is it possible that "Parasites are cutting into your dairy program?"
"Milk recording will be the key to a dairyman's survival in the coming years," says John Moxley, Director of DHAS on
For the latest developments in forage crops, turn to Professor Bruce Coulman's article on
The first of two articles on one of the hottest and most debated topics in recent time — "The Crow Flies East" by Garth Coffin on
The Minister of Agriculture Eugene Whelan visited Macdonald recently

Bring spring a little closer by starting some garden plants indoors
Apple, pear, cherry, plum — a Rootstock Review
Teacher, writer, broadcaster, a former editor on the Family Herald, a former Editor of the Journal, and farmer extraordinary, we welcome a visit from friend H. Gordon Green
What happened on World Food Day at Macdonald?
Last year Macdonald became an official All-America Selections Display Garden. Interested in what's new in garden flowers, then turn to
Macdonald is proud of the Earle W. Crampton Award

Macdonald Branch President Peter Knox recently presented awards to a bevy of brains and beauty
There was a Reception and Presentation for Jean Vauthier
"Put Your Best Foot Forward" introduces graduates to prospective employers
Grads remember Mac with special gifts
Professor John Moxley went island hopping in the Caribbean. He brought back welcome news of graduates
Chairman Larry Johnston discusses the Alma Mater Fund on
The first Stuart McDonald Memorial Award is presented on
The "Gold Key" is making a comeback
A glance at the fourth Macdonald Dietetics Pin Ceremony
Macdonald Athletics: Future

The field day demonstration at the Morgan Arboretum is a popular event for both demonstrators and spectators
Who gives a hoot about the Ornithology owl-banding expedition? We do
Faculty Lecturer M.E. Jennaway-Eaman finds being a panelist for the CSA a fascinating and worth-while experience which she would like to share with you on
The official opening of the Visitors' Centre is pictured on
Another laboratory for Mac — this time it's the Dairy Bureau of Canada
Professor J.D. MacArthur is impressed with the agri-winch that has been loaned to the Arboretum for testing and demonstration
Meet the Rotary Club of Montreal's third Foundation Scholar on
Professor R.S. Broughton briefly highlights the very valuable and highly appreciated Agribusiness Awards on

Features

Diploma Corner
Fun, Fact, Fable, Fiction
Prof Profile
Seeking Solutions
P.S.
Newsmakers

Cover Story

This is the fourth consecutive February issue in which we have focussed special attention on dairy industry. Put simply, "it's pretty important" and therefore Professor John Moxley, who ordnates the dairy articles, and his colleagues feel strongly about the value of this extra attention to Quebec's number one agricultural industry. As this is the third of the "new look" quarterly Journals to be published, the major percentage (40%) of the material is aimed at the interests of rural population. Apart from other articles, may we draw your attention to the up-to-the-minute piece on "The Crow Flies East." One of the most joyful hours of my life was photographing animals on our cover when they were just a few weeks old. It still took time and patience to this month's cover, and it has been fascinating to watch the progress of these animals — all born as the result of embryo transfer. I hope we may continue to focus on them as cover material.

Embryo Transfer and Other New Technologies

Dr. B.R. Downey
Department of Animal Science

More than two years have passed since the animals shown on the front cover first appeared in the Macdonald Journal. The four daughters (a fifth daughter died as a calf) of Macdonald Princess Oleana 3rd, all born in July, 1980, as the result of embryo transfer, are now having their first offspring; and it will be interesting to follow the progress of these four full sisters throughout their first lactations.

During this time, the bovine embryo transfer industry has matured to the extent that 50,000 pregnancies were produced in North America in 1982 and twice that number are projected for 1984. The number of commercial companies offering the procedure has stabilized, while increasing numbers of practicing veterinarians as well as artificial insemination organizations have successfully entered the field. Virtually all embryo recoveries and 90 per cent of transfers are done non-surgically and an equally high number are now being carried out right on the farm. These facts have contributed toward lowered costs. More and more evidence is accumulating that sex ratio at birth, incidence of abnormalities, and percentage calves weaned per number of pregnancies resulting from embryo transfer do not differ significantly from offspring produced by conventional breeding. There is some evidence that early embryonic loss may be higher than normal although the abortion rate after 90 days is not increased with embryo transfer.

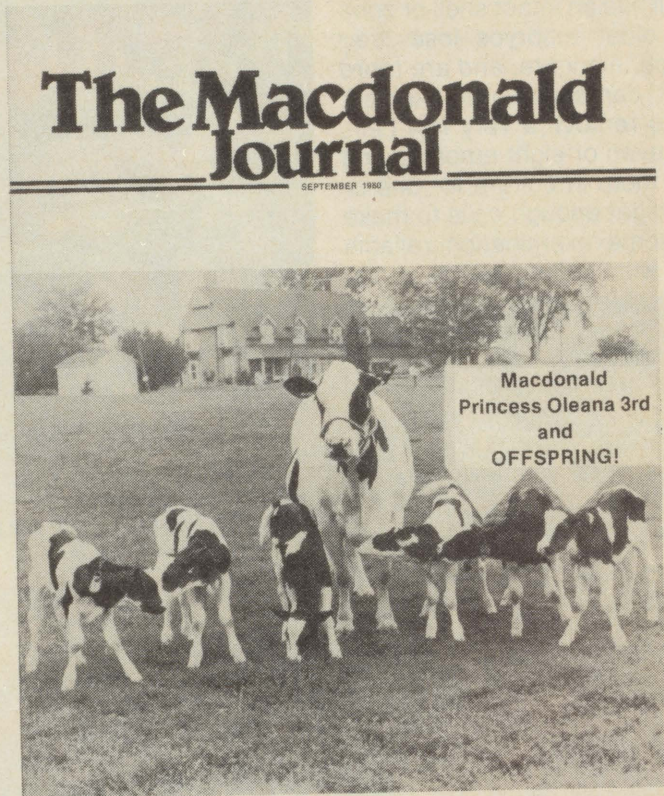
One useful application of the embryo transfer technique is in testing bulls which may be carriers of particular recessive genetic defects. For example, a small percentage of bulls in certain blood lines carry the gene for syndactyly (also called mule foot; fusion or non division of the digits or hooves) which may only be expressed if the bull is mated to a cow which also carries the recessive gene.

Since the odds of this occurring in the natural population are low, a few hundred calves may be born from such a male before he is found to be a carrier. By superovulating a cow homozygous (having a pair of the recessive genes and thereby having fused hooves or syndactyly) for the condition and inseminating her with semen from the young sire under test, as few as eight normal calves will exonerate the bull as a suspected carrier (with 99.6 per cent accuracy). In actuality, the embryos can be transferred in pairs to recipients, with the intent of establishing eight pregnancies. By 60 days, when the hooves of the fetuses are well-formed, Cesarean sections on all recipients can be performed, fetuses examined, and a definitive judgement on the bull made. Hence, the status of the bull can be determined in less than 90 days. Without embryo transfer technology, this fact might not surface for several years and thousands of dollars later,

by which time the gene would be widely disseminated in the population through the bull's offspring.

Long-term storage of embryos has still to be perfected, although a pregnancy rate of about 33 per cent is being achieved with freezing and storage in liquid nitrogen. Since embryos can be stored in culture (in a test tube) for only 36-48 hours, the required number of recipients must be available within a short space of time. Longer term storage would alleviate this fairly costly problem. Improvements in the frozen embryo procedure have been made; for example, thawing can now be carried out more quickly and simply than was possible previously. This will be of particular benefit in the exportation of embryos to foreign countries where conditions for embryo handling may be less than ideal.

In 1976 the sex of embryos as young as 13 days old was determined successfully by identifying the sex



chromosomes (XX or XY) in rapidly growing cells from the membranes surrounding the embryo. Since that time, efforts to carry out the same procedure in younger embryos — and have then survive — have been unsuccessful. Normally transfers are done at seven or eight days when the embryo still has an intact shell or zona pellucida; older embryos lose their round shape, elongate, and are more subject to damage when handled. Attempts to remove a very few cells from day seven or eight embryos and reproduce them in culture for one or two days to get enough cells to make a chromosome examination reliable have met with limited success. An additional problem is the need to store the embryo during the time taken to determine its sex.

A second method of sex determination has received considerable study. Measurements of the H-Y antigen, a protein substance present on the surface of all male embryos, should provide an even simpler means of identifying male embryos. To date, the production of an antibody of sufficient specificity to combine with the bound H-Y antigen, thereby identifying the embryo as male, has been difficult.

The separation and sex identification of spermatozoa has been the subject of numerous research efforts over many years; to date, separation of bovine sperm has not been successful in producing a major shift in the sex ratio.

During 1982, the first calf conceived as the result of *in vitro* fertilization (a true test-tube calf) was born in Pennsylvania. At the same time, workers in Wisconsin reported success in fertilizing eggs recovered from slaughter house ovaries. Such eggs or oocytes, several thousand of which may be present in an ovary, were matured *in vitro* prior to the addition of bull sperm. The theoretical consequences, if such a technique were perfected, are astounding. At the time of slaughter of an old but valuable cow, several dozen oocytes might be recovered, fertilized *in vitro* and transferred to recipient mothers.

Closer to reality is the production of monozygotic or identical twins. The female calves seen on page 3 are the monozygotic twins produced on the farm of M. Laurier Gauthier, St-Basile, comté de Portneuf, Québec, from the

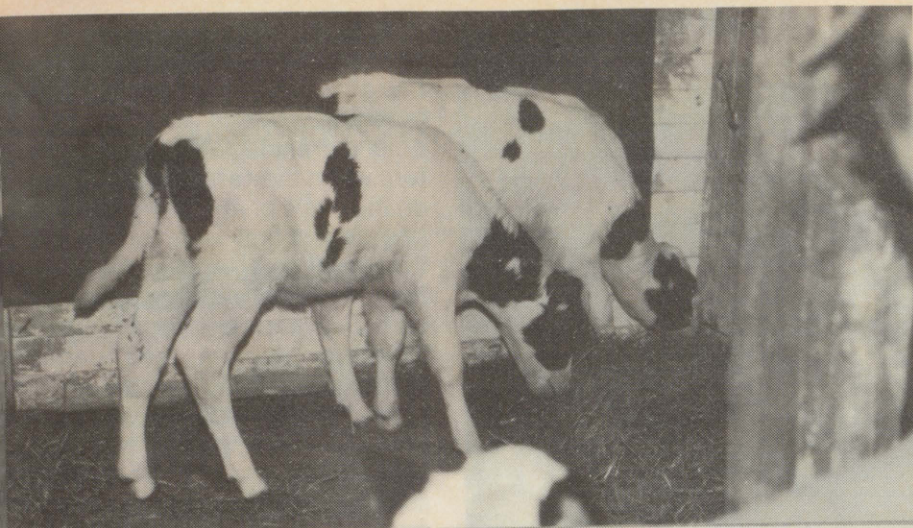


Above: As a four-year-old Macdonald Princess Oleana 3rd produced over 10,500 kg of milk and 342 kg of fat with B.C.A.'s of 212 and 189. After the birth of her fourth calf, a displaced abomasum and acute mastitis and metritis resulted in a long convalescent period and the permanent loss of two quarters. Embryo transfer represented a way to salvage some of the cow's superior qualities. Below: The four heifers and one bull (centre) were the result of 13 transfers. The fifth heifer was born as a calf.



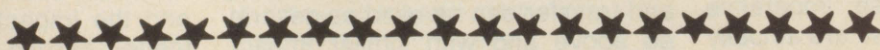
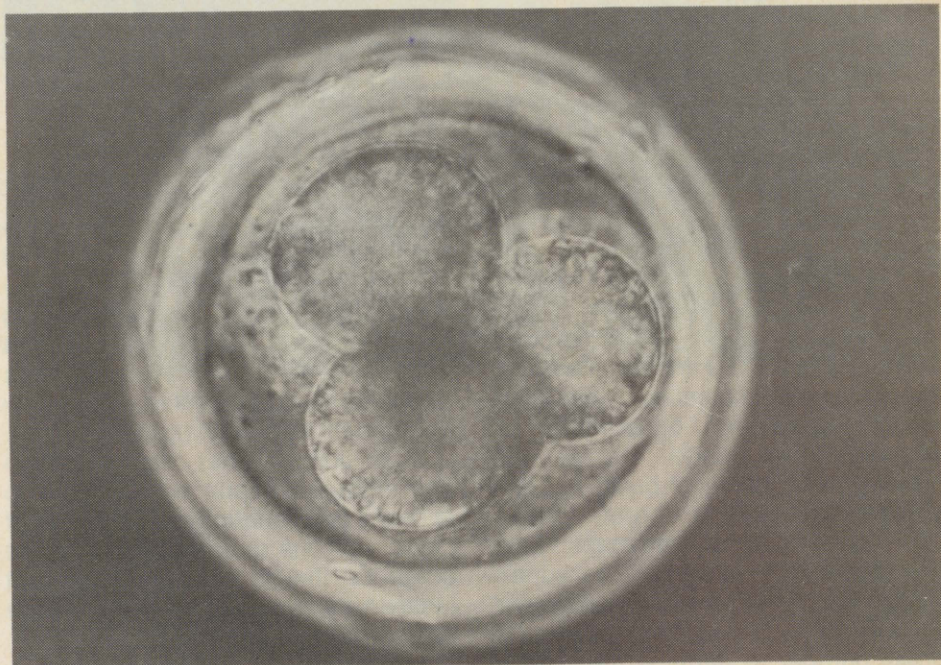
single embryo transferred by Drs. Denis-Pierre Ménard and Manuel Bedoya of St. Clet. In nature, this occurs only rarely (these are the first such twins to be registered in Canada as the result of embryo transfer). However, techniques have been developed where "splitting" of an embryo prior to transfer is possible. The embryo, such as that pictured on page 3, can be split into two, three, or four, and each of the individual cells (called blastomeres) can be matured *in vitro*

prior to transfer into recipient mothers. Special techniques are required to maintain and grow the individual blastomeres outside the body, but each one has all the necessary chromosomes (and other parts) for a complete calf. Around the world, identical twins or triplets have not been produced in several species by employing methods of embryo splitting. This is the closest thing to true "cloning" that has been achieved in higher vertebrates.



Left: Monozygotic (identical) heifer calves produced as the result of transfer of a single embryo. The calves were born on August 17, 1982, on the farm of M. Laurier Gauthier, St-Basile, Québec. Below: Three of the cells (blastomeres) are visible in this four-celled embryo. With embryo "splitting" techniques, each may produce a calf, all of which would be identical.

Since monozygotic twins are always of the same sex, several practical uses for them are possible. For example, one of the twins could be sacrificed in order to determine the sex, and the second transferred. A second possibility is that they could both be transferred to produce twins; the production of a freemartin is possible, thereby making twinning more desirable. Perhaps the most exciting applications are those that exist for research; identical (paired) herds would substantially reduce the numbers of animals required due to reduced variability. The influence of environment, as distinguished from inherited factors, on animal growth, development, and behaviour could be studied. The prospects for the future are exciting.



Some Implications for Animal Breeding

Professor J.F. Hayes
Department of Animal Science

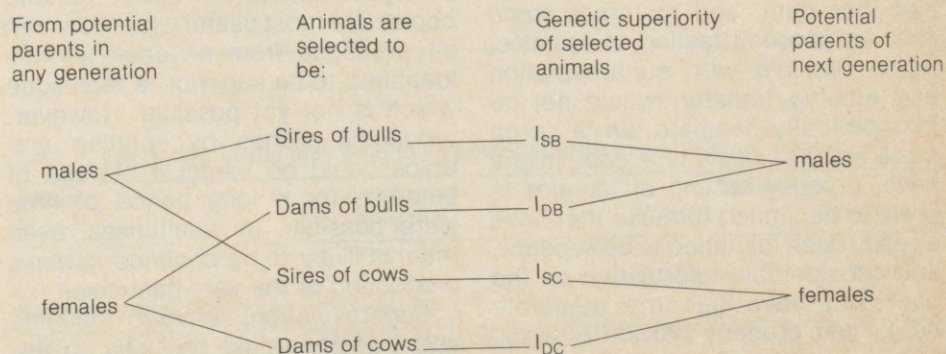
Comments are made on only some of the possible implications for dairy cattle breeding of a few of our new technologies.

The low reproductive rate of dairy cows has dictated the structure of our existing breeding programs. Rather than selection pressure can be applied on the female side and females evaluated with less accuracy than males. How can superovulation and embryo transfer be applied within the framework of present breeding

programs to obtain greater genetic improvement? Figure 1 shows how

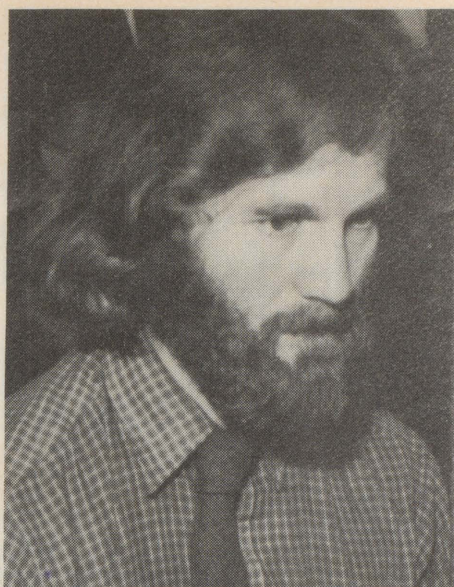
selection of animals operates to obtain genetic improvement.

Figure 1.



Superovulation and embryo transfer will have little if any influence on the genetic superiority of sires of bulls (I_{SB}) or sires of cows (I_{SC}). The reason is that the reproductive rate of males is already sufficient for them to be progeny-tested as accurately as testing facilities allow and for the selection intensity among them to be independent of reproductive rate. Some improvement in accuracy could be obtained, however, from standardizing the merits of the mates of bulls on test. The bulls on test could sire progeny from the same donor, replicating the process over a numbers of donors. This could be done, for example, in the case of males being sampled to obtain sires of bulls. If superovulation and embryo transfer were to mean that less semen be required and consequently fewer sires, intensity of selection among males would then be increased. Present practices of fertilizing superovulated eggs, however, do not reduce semen requirements.

The most obvious benefit of superovulation and embryo transfer is to increase the impact of individual cows in a population. The impact of embryo transfer for females parallels to a large degree that of artificial insemination for males. The genetic superiority of dams of bulls (I_{DB}) can be increased through greater selection intensity, since many less dams are required if each can be superovulated and the embryos transferred to recipients. Since the impact of a small number of dams is then much greater, it is, of course, imperative that the ones we choose are actually the best ones, i.e., it is advisable that accurate evaluations be available on the dams so that the correct ones are selected. Therefore, all available information should be used in indexing cows. It is likely, however, that this information would never be more than the record on the cow herself, her sire, her dam, and maternal grand sire, as progeny testing of females, while possible with superovulation and embryo transfer, would not be economically feasible on a large scale and also has a time cost. In any case, progeny testing of females is likely to be limited to those that have already been identified to be superior, and considerable information on the dam will have become available before her progeny provide records.



Professor J.F. Hayes

A further drawback of the female progeny test would be that the number of progeny would be small, and they would be located in very few herds (compared to a progeny test of a male). However, sons and daughters would be evaluated more accurately if their dam had been progeny tested.

It is unlikely that superovulation and embryo transfer will be used to improve the genetic merit of dams of cows (I_{DC}). The reason is that present costs of the technique would not justify its application on such a large scale as would be required.

The technique of embryo splitting and transfer can be used as described above and with similar impact, since essentially it further improves the reproductive rate of females. However, present costs of embryo splitting and transfer would not justify its use in this sense. However, it can also be more powerful, since splitting embryos produces "clones," i.e., exact genetic copies. Exact genetic copies are most useful when they can be produced from an adult already identified to be superior, a technique which is not yet possible. However, producing clones by splitting embryos could be useful if storage of embryos for a long period of time were possible. Its usefulness, even then, is likely to be confined to mass production of the very best cows.

Superovulation, embryo splitting and transfer could be used to for-

mulate a breeding program different in structure from the conventional one above. For example, one possible breeding strategy would be to select among transferred sons and daughters when they are about one year old on the basis of an index of their dam's (the donor) first lactation record, her full sib sisters' and half sib sisters' first lactation records, their grand dam's several records, etc. In such a breeding program, one can show theoretically that the *annual* rate of genetic improvement is vastly greater (even doubled) than in the most efficiently operated conventional scheme. The main reason is that the generation interval is reduced enough to more than offset the loss in accuracy of evaluations of individual animals. The scheme would require a smaller number of recorded animals, which should result in greater control over recording, breeding, and selection and lead to a larger proportion of the possible genetic gains being realized in practice. Hence, embryo splitting could have a major impact on the rate of genetic improvement if it were used outside the framework of the conventional breeding program.

Embryo splitting and transfer could have an impact in dairy cattle in ways other than improving milk yield. The possibility of more efficient testing of bulls to determine if they are carriers of genetic defects, and sexing of embryos has been mentioned above (B.R. Downey). Rare genotypes, such as twinning or favourable protein to fat ratios, could be replicated rapidly and the impact of sex-linked genes (genes carried on the sex chromosomes) could be increased. Should genetic selection for multiple traits be desirable, embryo splitting and transfer has an obvious advantage since only a few animals are likely to be superior in all traits. In the case of traits that are expensive to record (feed efficiency is a possibility), and hence likely to be recorded on only a small fraction of the population, embryo splitting could be used to maintain a reasonably high selection pressure. From the standpoint of research, exciting possibilities exist because experimental designs that were hitherto impossible are now feasible. Examples are designs to study genetic and environmental maternal effects and common environmental effects.

The real cost of keeping a bull on the farm

by Lionel Moreau, Agrologist
Moreau, Dumoulin, Vignola
Consulting Agrologists

During his career, the dairy producer makes many decisions that influence, directly or indirectly, the profitability of his operation. One such decision that is quite important these days is whether a dairy producer should keep a bull or rely solely on artificial insemination. In order to shed some light on the subject, we will look at the cost of owning a bull and, in order to keep matters relatively simple, only the Holstein breed will be studied.

The costs of using a bull can be divided into direct and indirect costs. The direct costs include the purchase price of the bull, his feed, lodging, and so on. Indirect costs refer to the revenue (or lack thereof) obtained from the use of this bull: his daughters' contribution to the herd.

Direct costs

Table 1 breaks down the cost of keeping a bull on the farm. It should be noted that the feed costs, like all the others, are average values and not those of one particularly favourable year.

Indirect costs

After going over the direct costs, let us look at the indirect or hidden costs of a bull. The value of a bull's daughters can be assessed at two points: in the "bucket" or in the sale's barn.

Milk production of progeny. Table 1 compares the milk production of cows born from insemination and from natural service. These data are from an American source since no Canadian statistics are available on this subject. We consider that these figures apply quite well to Quebec because if we compare the average milk proof index for the active bulls of the CIAQ (Centre d'insémination artificielle du Québec) and the average index of farm bulls which is between 0.5 and 1 in Quebec and in the United



Handling a bull at the Centre d'insémination artificielle du Québec (CIAQ).

Table 1. Annual cost of keeping a bull on the farm

Variable costs	Estimate
Forage (5 t hay at \$60/t)	\$ 300
Concentrate (160 kg at \$0.20/kg)	32
Straw (3/4 t at \$40/t)	30
Miscellaneous (minerals, medication, insurance, electricity, etc.)	30
Salary (38 h at \$5/hr)	190
Interest on variable costs ($\$330 + \$252/2 \times 17\%$)	78
Fixed costs	
Cost of barn space used by bull ($\$2000 \times 13.5\%$)	270
Interest on money invested in bull ($\$1000 \times 17\%$)	170
Total annual cost	\$1100

Table 2. Evaluation of the milk producing potential of cows of different origins

Origin of cow	Production potential	Weight	Difference Revenue
Artificial Insemination	554 kg		
Natural Service	84 kg	470 kg	\$90

Adapted from Dairy Herd Improvement Letter, October 1982.

States, we obtain similar results.

For revenue calculations, we have used a price of \$19 per hectolitre of milk sold. This price takes into account the costs for transport, publicity, other deductions, and the higher cost of feed for the higher production.

Cash value of the progeny Each year the dairy farmer culls some animals. It is rather difficult to evaluate the influence of a cow's origin on its value in the auction ring. We have used the prices paid for cows bought for dairy production at some Quebec auctions in 1980 and 1981. The results of this study are presented in Table 3.

Considering that the price of a cow reflects its looks as well as its milk production and considering that a cow's environment explains 75 per cent of the variation found in both factors whereas genetics accounts for the other 25 per cent, we can apply the same ratio to the price difference already calculated in Table 3: 25% of \$405 = \$101 per cow. If we assume that the active life of a dairy farmer between purchase and sale of his herd is 20 years, then the loss per cow is $\$101 \div 20 \text{ years} = \5 per year .

Table 3 then tells us that Holstein grade cows born from artificial insemination sell for 52 per cent more than those born from natural service.

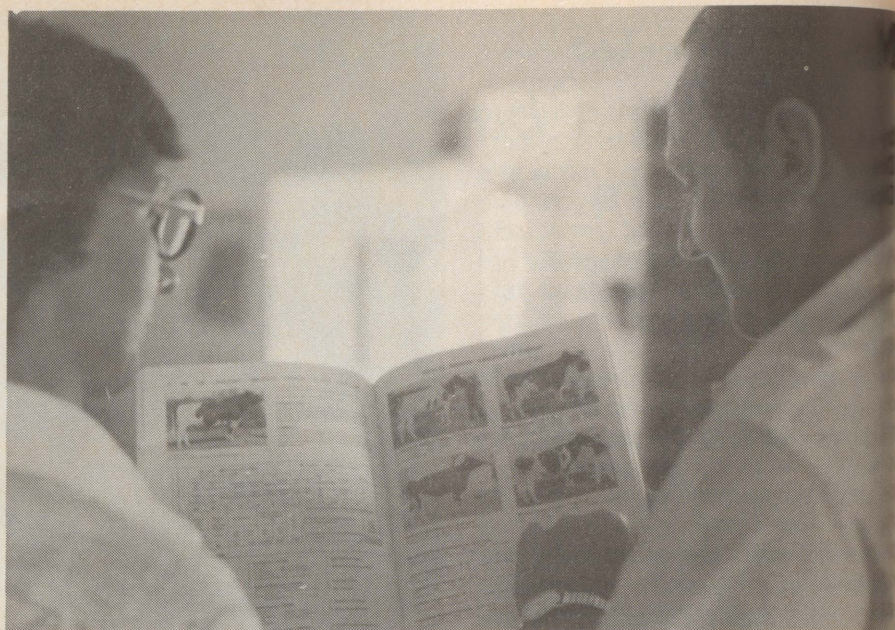
Data were also compiled from auctions of purebred Holstein herds held in Quebec during the same period. All of these herds were on an official milk testing program. Within these herds we found some cows born from natural service rather than insemination. The prices paid for the latter were 25 per cent higher than for the former when both were in the same production class. The average price difference for the eight auctions studied was \$310.

A summary of all the costs mentioned up to now is presented in Table 4.

Other advantages and disadvantages of keeping a bull on the farm are:

Advantages

The advantage most often mentioned by bull users is a reduction in calving intervals. However, many studies have proven that a well done insemination is as likely to succeed as natural service. Accurate heat detection remains the most difficult technique to master.



A CIAQ brochure gives you most of the facts required in selecting a potential service sire.

Table 3. Prices paid for non tested Quebec Holstein grade cows in 1980-1981

Origin of cow	Number of cows	Average price	Estimated milk production capacity
Artificial insemination	175	\$1182	5127 kg/year
Natural Service	325	777	3766 kg/year
Difference	—	405	1361 kg/year

Table 4. Annual cost of using a bull as sole sire for a 40-grade Holstein cow herd

	For herd	Per cow	Per service (1.7 per cow)
Direct costs	\$1100	\$27.50	16.18
Loss of milk production	3600	90.00	52.94
Loss of sale value	200	5.00	2.94
Total cost	\$4900	\$122.50	\$72.06

Disadvantages

We will go over them briefly: higher risk of propagating sexually transmitted diseases, higher risk of injury to the cow, no results available on milk and fat proof tests, conformation, and fertility of the bull.

Conclusion

This study gives the dairy producer the tools needed to take a decision as to the use of a farm bull. During these tough times, nobody can afford the risks offered by the use of a bull. The progressive manager has to use the most modern techniques available.

The final choice always rests squarely on the manager's shoulders however. The dairyman who has problems in heat detection, who has few debts, who does not need maximum production from his herd in the next few years, or who sees his work load eased by using a bull on his farm, has that choice.

To the farmer choosing to use a bull we say this: consider the future. Will your children take over the farm with the present herd? You will be lowering the productive capacity of the farm and, therefore, its loan repayment capacity in the future. The real cost of keeping a bull always includes all the losses associated with his use.

Maintaining Income and Butterfat Levels

by J. Stuart Bowman
Director of Farm Practice
Diploma in Agriculture Program

Around this time every year farmers are spending more time analyzing last year's production, income, and expense records. Often they find that butterfat levels have been slowly declining. A drop in the butterfat level from 3.7 kg/hl to 3.2 kg/hl has resulted in a \$7,000 milk income loss to the owner of a local 40-cow herd. The majority of this loss would have been a profit, a profit loss that he and very few other dairymen can afford in times of stagnant milk price increases, lowered quotas, and high interest rates.

Since September or October many farmers have noticed a rather rapid fat test decline. In most cases it is an indirect result of the poor hay yields experienced last summer. "How," you may ask, "can this affect my butterfat level this winter?"

To answer this question we must first know some of the factors affecting fat levels and how they react with the cow to produce a drop in butterfat. Often, producers blame declining fat test results on genetics. The feeling is that "My use of high milk proof bulls has resulted in a herd not capable of producing adequate levels of butterfat" is often voiced. However, only in a few circumstances can any significant butterfat decrease be blamed on genetics. By studying the fat test proofs of the top milk proof bulls from a few years ago we will find they averaged only about -0.10. Thus, extensive use of these sires over the last four or five years would not result in a large butterfat drop. To evaluate your herd's genetic standing in regard to butterfat production, compare your herd's butterfat and protein levels with those in Table 1. If your herd is producing levels of both butterfat and protein below breed averages, then there is likely a genetic problem in your herd. The only way to correct this is to make sure that you do not use bulls with a negative fat test proof. Selection of sires with a positive fat test will eventually improve your butterfat and protein tests.

If butterfat is the only component significantly below provincial breed

average, then you may have a nutritional problem. If your protein level is higher than your fat level, then you almost definitely have a nutritional problem. This year that problem is likely a lack of adequate fibre intake or a lack of fibre of the right physical structure. As with many farmers in this area who experienced low hay yields due to last summer's drought, you have probably limited your feeding of hay. However, in order to maintain or improve your herd's production you have increased your feeding of corn silage, high moisture corn, and grain. This can have serious effects on your butterfat level.

Under normal circumstances a cow consumes her feed, hay, and grain without chewing it. Later, while resting, she will regurgitate this food to be chewed. This "chewing her cud" makes her produce large quantities of saliva which contain a natural buffer that maintain the near neutral pH level in the rumen. When the pH in the rumen is maintained at near neutral, microorganisms in the rumen produce adequate quantities of acetic acid, along with propionic and butyric acid. All three of these volatile fatty acids provide the cow with an important energy source; however, she uses each of them somewhat differently. Acetic acid promotes butterfat production. A lack of this one acid will cause butterfat production to drop rapidly. When the cow consumes grains or finely ground feeds she has no reason to regurgitate and chew these feeds since they are already finely ground and are very easily

digested. Therefore, no saliva is produced, no buffer is produced, and the pH in the rumen drops, making the contents very acidic. Under such circumstances, the acetic acid producing microorganisms die off, leaving those that produce the other acids. Without the production of the acetic acid, butterfat levels drop. Therefore, in order to maintain butterfat levels you must maintain the pH of the rumen. You can do this by:

1. feeding the cow chemical buffers;
2. feeding natural buffer sources;
3. making her produce her own buffers (saliva).

If you are short of high quality hay this year, the first of these choices — feeding chemical buffers — can be accomplished quickly and easily and should show results within a couple of weeks. Over the long run, however, it is the most expensive of the three choices. The generally recommended chemical buffers and the amount to be fed are given in Table 2.

There are problems with feeding chemical buffers. The use of magnesium oxide or sodium bicarbonate as the only buffers will often result in feed refusal or depressed grain intake. Therefore, it is best to use a combination of bentonate and bicarbonate with magnesium oxide at one half of the levels per tonne shown in the Table. The use of buffers to increase butterfat levels in herds that do not have a depressed butterfat level has shown no response and thus is a waste of your money.

Table 1. Average butterfat and protein levels in Quebec herds

Breed	Average Butterfat		Average Protein	
	kg/hl	%	kg/hl	%
Holstein	3.66	3.55	3.22	3.18
Ayrshire	3.97	3.85	3.39	3.29
Jersey	4.85	4.71	3.96	3.84

(From Rapport Sommaire du PATLQ 1981.)

Table 2. Buffers and amounts to feed.

Mineral Buffer	Feeding Level as Sole Buffer kg/head/day	Reg'd. Level kg per tonne, grain mix*
Sodium bentonate	0.4	32
Sodium bicarbonate	0.2	16
Magnesium oxide	0.1	8

*Amount/tonne based on feeding 12.5 kg grain/head/day.

The second and third of these choices — the best long term choices — may not be able to be implemented until the next harvest, which we hope will be successful. Alfalfa and other legume hay crops have excellent natural buffers in them; thus, the feeding of such crops as either hay or haylage will promote proper rumen pH and, therefore, butterfat production. Also, the feeding of haylage (cut at an average length of 2-2.5 cm) or long-stemmed hay promotes cud chewing and the production of the cow's own buffer. The combination of feeding alfalfa hay or haylage can prevent low rumen pH and low butterfat levels. However, the cow must receive adequate amounts of this material in order to receive enough natural buffer and to stimulate ruminant activity and cud chewing. In general, do not feed a cow more than 60 per cent of her dry matter intake from grain and maintain at least 40 per

cent of her intake from roughages such as hay, haylage, or corn silage. In order to promote or maintain high production these roughages **must** be of a high quality. If your roughage intake is marginal or if corn silage contributes to more than one half of the total roughage, you should use a feed analysis and ensure that the cow's diet contains a minimum of 17 per cent crude fibre or 21 per cent acid detergent fibre (ADF). Corn silage, as a roughage source, does not promote proper rumen pH.

Other factors you should keep in mind for the next harvest to help you avoid low butterfat tests are:

1. Do not harvest direct-cut hay silage for storage (moisture > 60 per cent) and do not cut any haylage shorter than an average of 2 to 2.5 cm.
2. Do not harvest corn silage at greater than 70 per cent

moisture and keep it chopped to an average length of 1.5 to 2 cm. If you feed corn silage heavily, be sure you feed a minimum of 3 to 4 kg of high quality dry legume hay per cow per day.

3. When possible, roll or crack your grain mix ingredients, do not grind them. If you must grind them, use the largest screen you can that will not let the whole grain pass through.
4. For the highest producing cows you should try to feed their grain ration in at least three separate feedings rather than two.
5. Feed a flake of hay per cow prior to grain feeding.

By following these recommendations, several farmers have brought their butterfat levels back to normal, have increased their production efficiency, and have increased their profit margins.

Coping with Low Quality or Quantity Forages

by Professor Elliot Block
Department of Animal Science

At about this time of year, and for various reasons, many dairymen are realizing one of two — or both — potentially expensive situations; not enough forages are on hand to make it through the year, and/or forage quality is so low that too much of the milk cheque must be spent on grains and supplements. For some, the reason for a shortage is simply not enough planning. The time to work on feed shortage problems is not now when the hay mows and silos are empty but in the spring and summer when you can take a reliable inventory of forages and plan on how much you will need next year. If you foresee a bad cropping year, maybe you should consider making silage out of that field of corn; maybe that oat or barley crop should be made into forage. Remember, once the season is too far along there is no forage value to these crops and, therefore, your decision must be made early.

Low quality forage may be the result of poor forage management. Time of planting, seeding and fertilization rates, date of cutting, and moisture

content of forages are as important as the 305-day production of a cow. In these times of high grain prices (and higher prices are expected) dairymen must begin to realize that the protein and energy content of crops harvested on their farms should be as high as economically possible to counteract grain prices. This point is illustrated in Figure 1, which shows some relatively simple calculations based on an uncomplicated ration of hay (or haylage), containing 18 per cent versus 12 per cent crude protein, corn grain, and soybean meal. The rations are not balanced for vitamins or minerals but are a guideline to determine the savings realized by harvesting a higher quality forage. The calculations take into account the differing intakes and requirements of cows throughout lactation as well as the fact that lower quality forages cannot comprise as much of a ration as higher quality forages because of their lower energy content, thereby increasing the grain requirements. Again, these are only rough calculations for demonstration purposes and do not represent "perfect" rations. The overall

summary shows that 622.6 kg of silage per cow extra will be needed and 54 kg of corn per cow less will be needed if you have 12 per cent versus 18 per cent protein hay. This translates into \$218.11 more per cow per year or \$10,905.50 more per year for a 50-cow herd because you are feeding a lower quality hay.

Now let us assume that you've done all things correctly but because of the forces of nature (i.e. climate) your harvest year brought ill fate to your forage crops. What do you do to compensate? As mentioned previously, if silo space is available you should have harvested some of your grain crop as forages. Now you must do a very fancy juggling act with the forages available. You must keep in mind that your highest producing cows in early and mid lactation need the best forages available to meet requirements and maintain intake. Therefore, feed your lower quality forages to dry cow, cows in very late lactation, and yearling heifers and save the best forages for your heifers and early to mid lactation cows. If you have a severe shortage and most of the forages are low quality, some

FIGURE 1. Amount of extra soybean meal (SBM) and corn fed due to feeding hay with 12% crude protein versus hay with 18% crude protein (see text for explanation).

I Cows in early lactation (first 70 days)

- require ration with 17% crude protein on a dry basis;
- consume approximately 3.0% of body weight in dry matter daily;
- 18% protein hay will comprise 50% of ration dry matter;
- 12% protein hay will comprise 40% of ration dry matter because of lower energy (more grain needed).

**RATION #1 (12% protein hay)
% of ration dry matter**

Hay	40.0
Corn	44.1
SBM	15.9

**RATION #2 (18% protein hay)
% of ration dry matter**

Hay	50.0
Corn	42.3
SBM	7.7

Partial Summary

- 8.2% more SBM and 1.8% more corn needed when feeding hay with 12% protein.
- for a 700-kg. cow this is 120.5 kg dry matter of SBM and 26.5 kg. dry matter of corn extra because of the lower quality hay.

II Cows in mid lactation (second 70 days)

- require a ration with 15% crude protein on a dry basis;
- consume approximately 3.4% of body weight in dry matter daily;
- 18% protein hay will comprise 60% of the ration dry matter;
- 12% protein hay will comprise 45% of the ration dry matter because of lower energy (more grain needed).

**RATION #1 (12% protein hay)
% of ration dry matter**

Hay	45
Corn	44.5
SBM	10.5

**RATION #2 (18% protein hay)
% of ration dry matter**

Hay	60
Corn	39.5
SBM	0.5

Partial Summary

- 10% more SBM and 5% more corn needed when feeding hay with 12% protein;
- for a 700-kg. cow this is 166 kg dry matter of SBM and 83.3 kg dry matter of corn extra because of the lower quality hay.

III Cows in the declining phase (last 165 days of lactation)

- require a ration with 15% crude protein on a dry basis;
- consume approximately 3.0% of body weight in dry matter daily;
- 18% protein hay will comprise 65% of the ration dry matter;
- 12% protein hay will comprise 60% of the ration dry matter because of lower energy (more grain needed).

**RATION #1 (12% protein hay)
% of ration dry matter**

Hay	60
Corn	30.3
SBM	9.7

**RATION #2 (18% protein hay)
% of ration dry matter**

Hay	65
Corn	35
SBM	0

Partial Summary

- 9.7% more SBM and 4.7% less corn needed when feeding hay with 12% protein.
- for a 700-kg. cow this is 336.1 kg dry matter of SBM extra and 163.9 kg dry matter of corn less because of the lower quality hay.

Overall Summary

Stage of lactation Extra (+) or less (-) feeds required because of feeding lower quality hay.

	SBM	Corn
	kg	
Early	+ 120.5	+ 26.5
Mid	+ 166.0	+ 83.3
Declining	+ 336.1	- 163.9
	+ 622.6	- 54.1

Economics (SBM @ \$300/ton; corn @ \$160/ton)

SBM —	622.6 kg ÷ 90% DM = 692 kg x \$.33/kg =	\$228.93
CORN —	54.1 kg ÷ 90% DM = 60.1 kg x \$.18/kg =	- 10.82
	Extra cost/cow/year due to lower quality hay	\$218.11

drastic ration changes and manipulations as outlined below must be made to try to maintain production.

I Chop hay to not less than 1.0 cm lengths.

A. Because of decreasing the length of the hay cows can consume more forage. That is to say that chopped hay takes up less volume in the cow's rumen and the cow can, therefore, consume more of the feed.

1. The addition of a buffer to the ration may be required to prevent a milk fat depression.

B. If hay is chopped and its quantity is decreased in the ration, be sure that the total ration contains at least 40 per cent forage on a dry basis.

1. If you add corn silage to a ration, keep in mind that corn silage is approximately 50 per cent forage and 50 per cent grain on a dry basis.

2. A ration with less than 40 per cent forage can result in metabolic problems and low milk fat.

II Decrease total forage content of ration to not less than 40 per cent of the total dry matter.

A. This may result in a low milk fat test. However, certain precautions can be taken to prevent this from occurring:

- include a buffer in the ration;
- process grains to a minimal extent (i.e., crack corn, roll oats, etc.);
- use high fibre grains such as rolled oats or corn and cob meal (or high moisture ear corn).

B. For lower producing animals and dry cows the ration can contain "fillers" to prevent over conditioning by feeding too much grain.

1. Fillers can include straw (chopped), sawdust, wood shavings, or paper products.

In this article, I have tried to show the importance of feeding quality forages and to point out some of the alternatives in case you find yourself short. These alternatives should be used in exceptional years, not as the rule. In any case, now is the time you should be pushing the pencil to figure out how much forage you will need next year, how much you will have at the end of summer, and what your cropping will be for this spring.

Are parasites cutting into your dairy program?

by Professor Elliot Block
Department of Animal Science

The problems and production losses associated with subclinical parasitism have been minimized in the past for a few reasons: Subclinical parasitism does not manifest itself with any visual clues such as animals going off-feed, emaciation, debilitation, etc., and, therefore, farmers do not even realize it exists in their herds. Producers are of the false opinion that it is too cold in Canada to allow parasite eggs to withstand the winters. Surveys which include Quebec, New England, and southern Ontario show that 92 per cent of herds tested have some degree of gastrointestinal parasitism and that 75 to 95 per cent of the cows within these herds are infected.

Many worms can live comfortably in your animals. Table 1 gives a basic description of the most common worms found in Quebec and their location within the animal. All of these worms are efficient in producing offspring. The eggs shed in the feces resist cold climates. The larvae live well in manure until they become infective and conditions favour their ingestion by cattle (i.e., pasture season). Figure 1 shows the life cycle of worms in cattle.

This life cycle indicates that only animals grazing pasture are susceptible to infection. This is not true. Cattle manure contaminates just about everything that goes into their mouths. Cows lick objects that are contaminated and nose through contaminated bedding material. Therefore, even in total confinement all it takes is one cow or heifer to have an infection and all animals will be infected in a short period of time.

How can these little parasites cut into your profits? The most common answer is that the worms are competing with the animal for the nutrients consumed. However, this is only part of the answer. Some of these worms suck blood from the gastrointestinal tract and all worms cause an irritation of the gastrointestinal lining thereby reducing its ability to absorb nutrients. Secondary bacterial infections can occur leading to diarrhea.

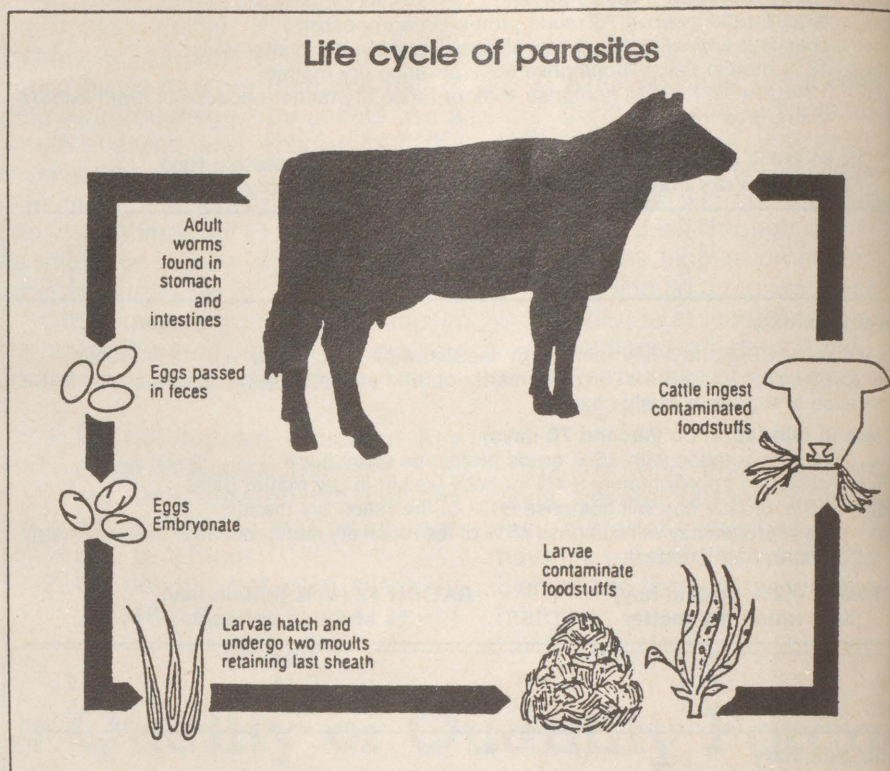


Figure 1.

Table 1. Scientific genus and common names of gastrointestinal worms and their location within the gastrointestinal tract of dairy cattle.

Scientific Genus Name	Common Name	Location
<i>Haemonchus</i>	Barberpole or large stomach worm	Abomasum
<i>Ostertagia</i>	Medium brown stomach worm	Abomasum
<i>Trichostrongylus</i>	Bankrupt or hair worm	Abomasum and small intestine
<i>Cooperia</i>	Small intestinal worm	Small intestine
<i>Nematodirus</i>	Thin-necked intestinal worm	Small intestine

When an animal is heavily infected, the obvious signs are diarrhea, loss of appetite, dehydration, and rough hair coat. However, you may be losing milk production or body growth due to parasites without any visual clue. Fecal egg counts done by your veterinarian may not show animals with worm burdens. Different species of worms vary the amount of eggs produced daily; the amount of eggs produced varies with the season of the year; immature worms do not produce eggs but can still harm the animal; the number of eggs produced can vary with types of feeds offered to cows. Obviously then, you may have a problem but not know it.

As an example, we conducted an experiment at the Macdonald Farm

where 23 heifers were treated for infection and placed on pasture while another 23 heifers were placed on an adjacent pasture with no treatment. The treated heifers gained 0.36 kg per head per day more than the untreated from May to September (120 days) which is a 43.2 kg per head net advantage. None of the animals showed any outward signs of parasitism. For the cattleman this translates into \$75.17 per animal (assuming \$1.74 per kg live weight). For the dairyman the advantage would be to get heifers to breeding weights earlier or if breeding weights are already achieved by 15 months, to get heifers to breeding weights with less feed. The cost of treatment can range from \$8 to \$15 per animal per year.

There are different products and procedures to worm your animals including top dressing on feed, injectables, boluses, and pastes. Some products require you to withhold milk. Read directions carefully.

If these products are given at weaning, there is no problem because colostrum cannot go into milk anyway. Many people commend worming twice a year if you treat the entire herd at one time using a product that does not call for milk withdrawal; once in the fall to

eliminate adult worms accumulated over the summer (the larvae from these worms mature during winter and lay eggs on spring pastures), and again in the spring before grazing which gets rid of worms that "overwintered" in animals and limits the egg contamination of fresh pastures.

Other management controls are to: (1) clean bedding in free stalls and stanchions; (2) keep water bowls and feed mangers clean of manure; (3) avoid manure contaminated feed; (4)

manage pastures (i.e., harrow down manure into pastures after grazing, rotation, set aside pastures where heavily parasitized animals have grazed previously).

Enough products and systems of control are available to suit every managerial situation to control the parasite population on a farm. Work with your veterinarian on determining the level of infection and a control program to suit your needs. It is not a question of whether or not to worm, but what to use.

WHY MILK RECORDING?

Dr. J.E. Moxley
Director, DHAS, and Professor
Department of Animal Science

Dramatic changes have occurred in Quebec's dairy industry in recent years. Between 1974 and 1981, the number of dairy herds declined from 9,886 to 19,258. The remaining dairy farmers are getting more serious about the business of herd improvement. In 1974 less than 20 per cent of the dairy farmers were on a milk recording program. By the end of 1981, there were 8,320 herds, or 44 per cent on a milk recording program. During the seven-year period between 1974 and 1981 the enrolment in the Dairy Herd Analysis Service (DHAS) program increased from 1,784 to 7,005 herds.

In the friendly rivalry between Quebec and Ontario, Quebec has had the larger dairy cow population and Ontario the higher production per cow. This is changing at least for cows on milk recording. For the past seven years, the rate of improvement in milk production per cow has been increasing 50 per cent faster in Quebec R.O.P. and official DHAS herds than in their Ontario counterparts. As a result, by 1980 and 1981 milk production per cow in Quebec official programs exceeded that of Ontario's. The Quebec regular (or owner-sampler) DHAS herds are now on a par with their Ontario counterparts. The average production per cow in Quebec appears to be still below the Ontario average, because we have a lower per cent of our herds on milk recording.

Participation in milk recording

varies across the province. At the end of 1981 in Region 12, the area around Lake St. Jean, the participation rate was 55 per cent with 595 herds on milk recording. In Region 7, the area south of the Ottawa river and Montreal Island and west of the Richelieu river and Lake Champlain, the participation rate was 35 per cent or 472 herds on milk recording.

Why should anyone be enrolled on milk recording? We have become more aware of the importance of energy conversion. In general terms a cow producing 3,000 kilograms of four per cent milk is using about 40 per cent of her energy intake to produce milk. A cow producing 6,000 kilograms of four per cent milk is using about 60 per cent of her energy intake for milk production. The remaining energy is used for maintenance. With the effective use of milk recording, the Israelies have increased production of Holsteins from 3,424 kilograms to 6,660 kilograms of milk per cow per year in a 25-year period. This has been achieved in an environment that is considered less than optimum for the Holstein breed. This would not have been possible without records and the efficient use of them.

In many parts of the world dairy farmers are paid for milk on the basis

of volume. Butter and cheese yields from milk depend on the composition of milk; thus our milk pricing system includes both volume and composition. Any dairyman can measure cow milk yields; however, individual cows differ in milk composition and, consequently, net returns. For example, a 21-cow herd which has a herd average of 6,600 kilograms of milk testing 3.6 per cent fat had two mature cows completing 305-day records in the same month. The production records were as shown at the bottom of the page.

In a non tested herd Cow A would have been underfed and culled and yet in a tested herd, she produced the same gross revenue and a slightly better return over estimated feed cost. Culling can be very inefficient without milk composition tests.

Dairy farmers are under pressure to produce less milk. There is overproduction of milk in Western Europe, United States, and Canada. In August 1982 industrial quotas in Canada were cut by 2.7 per cent. An additional cut of approximately two per cent was announced for January 1983. How can a dairyman earn more money by producing less milk? Table 1 gives a summary of meal intakes, gross returns, and feed costs at dif-

Cow	Milk (kg)	Fat (%)	Protein (%)	Milk Value (\$)
A	5,663	4.47	3.6	1,892
B	7,058	3.09	3.1	1,891

ferent levels of milk production. These data are a summary of the Holstein herds on the regular DHAS program in 1981. Naturally, higher meal intakes are associated with higher levels of milk production but so are higher returns per cow. Table 2 is presented to show the number of cows that are required at different levels of production to produce 200,000 kilograms of milk. If we use the data from Table 1 to indicate the average gross return per cow and assume that the total cost of milk production is twice the feed cost, we can estimate the net return per cow and the herd. This probably overestimates the net return from cows producing at 4,000 kilograms and underestimates the returns from the higher producing herds.

It would appear that the best way for a dairy farmer to compensate for a reduced quota is to milk fewer cows

Table 1. Production levels, meal inputs, gross returns, and feed costs reported in DHAS regular Holstein herds in 1981.

Herds (No.)	Milk (Kg)	Average Production/Cow Fat (%)	Protein (%)	Meal (Kg/cow)	Gross Returns (\$/cow)	Feed Costs (\$/cow)
716	4,067	3.53	3.08	1,225	1,257	587
2078	5,012	3.53	3.11	1,589	1,560	685
1495	5,975	3.55	3.15	2,018	1,878	790
238	6,939	3.54	3.18	2,460	2,200	894

Table 2. The number of cows required to produce a 200,000 kilogram milk quota and returns assuming feed is equal to half the cost of production.

Production Level Kg/Cow/year	Cows (No.)	Gross Returns (\$/cow)	Feed Costs x 2 (\$/cow)	Net Returns (\$) Per Cow	Net Returns (\$) Per Herd
4,000	50	1,257	—	83	4,150
5,000	40	1,560	—	190	7,600
6,000	34	1,878	—	298	10,132
7,000	29	2,200	—	412	11,948

producing at a higher level of milk per cow.

A complete milk recording service provides the dairyman with information that permits him to plan his breeding program, select replace-

ments, and cull efficiently. It provides information for more efficient feeding and keeps a check on his reproduction record. Milk recording will be the key to a dairyman's survival in the coming years.

Recent Developments in FORAGE CROPS

by Professor B.E. Coulman
Department of Plant Science

Forage crops have been the backbone of livestock feeding systems in eastern Canada since the beginning of agriculture in this region. There are several research programs in our region which are dedicated to the improvement of forage crops, and this article will report on some of the recent developments regarding the major forage species grown in eastern Canada.

Alfalfa

Alfalfa is the most widely used forage legume in Ontario and its use in Quebec continues to increase. The Quebec government's "Opération Luzerne" program in the mid 1970s stimulated much interest in alfalfa production, and this certainly has contributed to its increased use. In addition, as more land is sub-surface drained, this increases the amount of land that is suitable for alfalfa production as this crop requires good drainage for long-term production.

Over one half million kilograms of alfalfa seed is now sold annually in Quebec. The most commonly used

varieties are the older ones: Saranac, Iroquois, and Vernal. Saranac and Iroquois are still good performers; however, there are a number of new varieties which have yielded very well in the Quebec forage testing program. Two of the better ones have been Apica, produced by the federal research station at Ste-Foy, and Dekalb 120. There is a great deal of activity in alfalfa breeding, particularly by private companies, so we can expect more improved varieties in the near future.

Red Clover

As alfalfa acreage increases in Quebec, red clover use declines. Even so, there were over 600,000 kilograms of red clover seed sold in the province in 1981-82, making it the most frequently used forage legume. The major problem with red clover, of course, is its lack of persistence, as most plants in a stand do not survive into the third year after seeding.

Newer varieties of red clover, however, have proven to be more persistent and higher yielding than older

varieties and commercial seed. These newer varieties include Florex, Arlington, Tristan, and Prosper. Unfortunately, almost 75 per cent of the red clover seed sold in Quebec is "commercial." Farmers should be encouraged to buy pedigreed seed of these newer varieties as it represents a significant advantage over commercial seed.

Increasing interest has been shown in the use of red clover as a green manure crop. Red clover can be grown as a one-year break in the continuous production of corn to replenish the soil's organic matter and nitrogen. Research at Guelph has shown that an early seeded double cut red clover variety can add as much as 150 kg/ha of nitrogen when ploughed down in the fall of the same year, even after a hay cut is taken in July. Thus, red clover makes an excellent short-term rotation crop.

Timothy

Timothy continues to be the most widely seeded of all forage species grown in Quebec and the Maritimes.

THE CROW RATE ISSUE — PART I

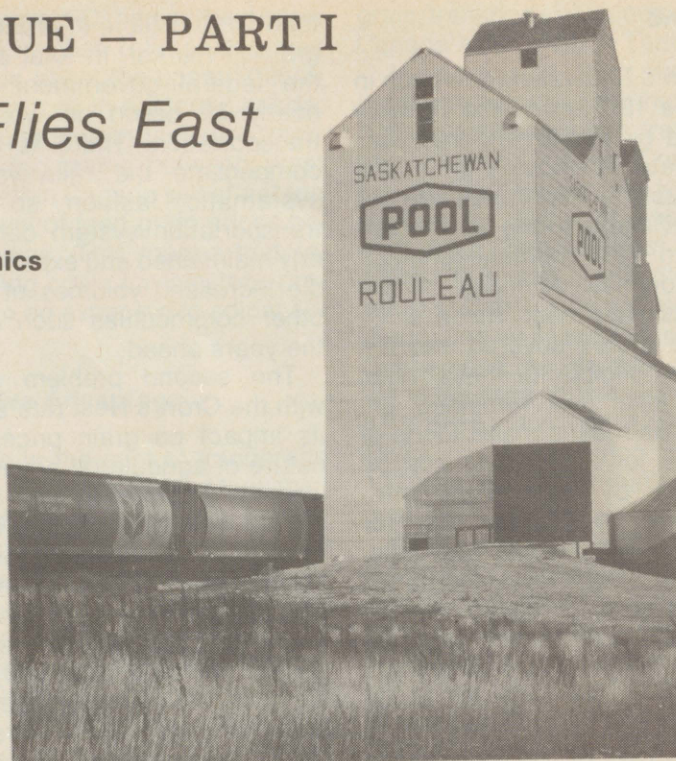
The Crow Flies East

by Professor H. Garth Coffin
Chairman, Department of Agricultural Economics

The federal government decision on changes in statutory rail rates for grains in western Canada was announced on February 1st. Until a few months ago, most of the study and discussion of this transportation policy was confined to the Prairie Provinces as the region most directly affected. But with the changes proposed in the Gilson Report¹ last year and announced by the government recently, concern has grown in eastern Canada, and especially Quebec, about how those changes might affect agriculture in this part of the country. In effect, it seems that 'the Crow' may be threatening to spread its shadow over agriculture in eastern Canada through the changes proposed in this rate structure.

This article takes a brief look at the Crow Rate issue and the reasons for

concern by eastern farm groups. A second article in the next issue will look at the final decision of the federal government and what the changes might mean for eastern agriculture.



¹ The "Gilson Report" entitled "Western Grain Transportation" was prepared by Dr. J.C. Gilson, University of Manitoba, at the request of the federal government, based on extensive consultations with interested parties in western Canada during the winter of 1982.

excellent adaptation, the availability of inexpensive seed, and its relative ease of establishment contribute to its continued popularity as a forage crop in eastern Canada.

Breeding programs have produced timothy varieties that differ in their time of maturity. For example, the new variety Salvo and also Toro are early maturing, Climax is intermediate, and County is late maturing. If a farmer grows smaller fields of different timothy varieties, not all of the hay crop will have to be harvested at the same time. This increases the chance of getting more of the hay crop harvested at the best stage of maturity and thus results in better quality hay.

Early varieties such as Salvo are also more compatible in mixtures with early varieties of alfalfa, especially if three cuts of forage are to be taken. At the early bloom stage of alfalfa, the early maturing timothy will normally be heading. Later maturing varieties would not have headed by this time, and their regrowth would be very slow if the mixture were cut when the alfalfa is in early bloom.

Reed Canarygrass

Reed canarygrass is a forage species well adapted to wetter soils. It, however, contains compounds called alkaloids which can affect the performance of grazing animals. A newer variety of reed canarygrass, Vantage, has been found to be the highest yielding reed canarygrass in the Quebec forage trials. In addition, Vantage is free of some of the alkaloids normally found in reed canarygrass and this removes some of the adverse effects. At present, there are breeding programs underway, including one at Macdonald, which will soon produce varieties of reed canarygrass almost completely free of alkaloids.

Annual ryegrass

A species which is receiving a lot of attention in the Maritimes is annual ryegrass. It is being increasingly used as a forage crop and is particularly useful as a rotation crop in potato-growing areas. Annual ryegrass

establishes rapidly and quickly produces masses of shoots and roots which is very important on soils subject to erosion. In addition, it produces high yields of forage, up to 10 tonnes D.M./ha and contributes significant amounts of organic matter when ploughed in in the fall. There are two types of annual ryegrass available: Westerwolds, which is taller and thus more suitable for conserved forage; and Italian, which is shorter and leafier and excellent for pasture. Recent studies have examined the possibilities of mixing a legume with annual ryegrass. This would reduce the fairly high quantities of nitrogen required for high yields of ryegrass.

Coated Seed

Some seed companies in eastern Canada have recently been selling "coated" forage seed. The coating is usually largely made up of finely ground lime and may contain nutrients such as phosphate that are required by the germinating seed. The coating on forage legume seeds also includes the

(Continued on page 16)

Background

The Crow's Nest rates have been in effect since 1925 when the Railway Act passed by Parliament that year fixed the rate for moving grain and grain products to export position out of western Canada at the level which prevailed in 1897 namely, one-half cent per ton-mile. Although certain adjustments have been made since then in the routes covered and the commodities eligible for these rates, the basic level has remained unchanged. This means that a tonne of wheat, oats, or barley can still be transported by rail from mid-Saskatchewan to Thunder Bay for less than \$5. Meanwhile, with inflation, all other freight rates and handling charges have increased. For example, it now costs nearly twice as much to put the grain through a country elevator in the Prairies as to transport it 1,000 miles by rail.

The true costs of transporting the grain are, of course, now much higher than the statutory freight rates. In a recent update of his study for the federal government on grain transportation costs, United States economist Carl Snively estimated that, in 1980, the variable portion of total cost of transporting grain by rail in western Canada amounted to \$547.5 million against a freight revenue of some \$132.9 million from grain shipments. Hence, even with federal government subsidies of \$170.2 million, Snively estimated that the railways lost some \$244.4 million on the basis of variable costs alone. Gilson has since estimated the **total** railway losses on the grain movement at \$644 million on a volume of 30.4 million tonnes in 1981-82.

Herein lies the first problem associated with the Crow's Nest rate — financial losses on this grain traffic have deterred the railways from making the necessary investments to upgrade (or even maintain) lines and equipment to handle increasingly larger volumes of grains and other commodities. Thus, when the export demand for grains increased in the 1970s, governments (mostly federal) and the Canadian Wheat Board were left to purchase more than 10,000 new hopper cars, at a cost of more

than \$400 million, in order to get the grain to market. In total since 1970, the federal government has spent nearly \$2 billion on western grain transportation. There is a need to compensate the railways in more systematic fashion so that the transportation system can be properly maintained and expanded to handle increased volumes of grain and other commodities such as coal in the years ahead.

The second problem associated with the Crow's Nest rate structure is its impact on grain prices and the nature of agricultural development in western Canada. In this case, it is argued that the artificially low freight rates have maintained grain prices in the Prairies at higher levels than would otherwise be the case, thereby acting as a deterrent to livestock production and other secondary processing of cereal grains. Hence, the challenge to the policy makers is to redress any inequities caused by the low freight rates while preserving the benefits to grain producers currently entrenched in law.

Against these and other dimensions of this complex problem, the federal government announced one year ago it was prepared to contribute, on an annual basis, an amount of money corresponding to railway losses on this movement last year, and to share future cost increases with the grain producers. In order to determine the exact amount to be paid by government, now and in future years, and to find the preferred method of payment, Dr. Clay Gilson, an agricultural economist at the University of Manitoba, was asked to carry out a consultative process in western Canada in search of a consensus on these and other aspects of the problem. His mandate did not include consideration of the effects of his proposals on agriculture in other parts of the country.

The Gilson Proposals and Eastern Concerns

In total, Gilson's report contains 13 major recommendations, several dealing with railway performance and the institutional organization for administration of the changes. The most important ones are those referring to

the amount of money to be paid by the federal government and the method of payment. In brief, Gilson proposed that the "Crow Benefit" to be paid by the federal government on an annual basis be set at \$644.1 million corresponding to his estimate of railway losses last year, and that the payment be phased in so as to be paid totally to the railways initially but only 19 per cent to the railway and 81 per cent directly to producers by 1990.¹ Moreover, the report recommends that the federal government pay into an adjustment program and share in future freight rate increases and capital expenditure programs such that the total federal contribution would range from 745 million to \$1 billion per year over the next 10 years. On a base volume of some 30 million tonnes of grain shipment, the contribution represents from \$25 to \$33 per tonne.

One question occurring to observers is whether or not the so-called "Crow Benefit" is really that large. If it is and if it has been accruing to grain producers, then there should be more evidence of it in grain prices and payments to producers than researchers have been able to find thus far. If it is not that large or grain producers have not been realizing benefits in the order of \$20 per tonne, then a policy which "preserves or guarantees" that kind of benefit represents a net gain to grain producers over the current situation.

In addition to the **size** of the federal contribution, however, agricultural spokesmen in eastern Canada are concerned about the proposed method of payment whereby the producer share of the "Crow Benefit" provided by the federal government would be paid directly to producers on the basis of cultivated acres. This means that payment of this portion of the subsidy would be totally unrelated to any actual movement of grain. The theory behind this proposal is that preservation of the "Crow Benefit" should not discriminate against local sales or use of the grain within the Prairies by pertaining only to grain moved out of the region. Depending upon the definition of eligible acreage

¹The Federal announcement indicates that payments will eventually be frozen at 50 per cent to the railways and 50 per cent to producers.

and the ultimate level of government contribution, it would appear that the annual producer payments might amount to from \$6-10 per acre. Hence, even for a modest sized farm in western Canada, annual payments would easily amount to \$10,000 or more and for some larger operations could exceed \$100 thousand per year. The question bothering farmers in eastern Canada is how that money will be used.

Presumably, this payment would compensate grain producers for the loss of revenue associated with higher freight rates. Under the Gilson proposals, the freight rate paid by the grain producer would increase, on a gradual basis, by up to \$13 per tonne in 1992. In other words, in areas where the present rate is \$4.89 per tonne, it might be adjusted to a level somewhere between \$13.33 and \$17.75 per tonne, depending upon the inflation rate and other factors affecting railway costs in the future. But there is some concern that the subsidy might be invested in livestock production to the point where eastern producers could have difficulty competing with their western counterparts.

Livestock and Poultry in Eastern Agriculture

Agriculture in eastern Canada is dominated by livestock and poultry production which account for approximately two-thirds of farm cash receipts. This domination reaches its highest in Quebec where animal agriculture represents nearly 80 per cent of cash returns from farming. This helps to explain the concern over the well-being of this sector as it might be affected by government policy. In total, more than 60 per cent of livestock and poultry sales in Canada occur in the eastern provinces. The relative importance of each commodity group is shown in Table 1.

Despite increased grain production over the past few years, the region remains dependent on western Canada and the United States to supply part of its feed grain needs. In total, some two million tonnes of feed grain are shipped into eastern Canada from other areas, mostly the Prairie Provinces. The dominance of U.S. corn in world grain markets, and recognition

of its influence in Canadian feed grain policy, means that U.S. corn prices will continue to set the upper limit on feed grain prices in eastern Canada. However, changes in the transportation costs for grains between West and East within Canada will affect the relative level of feed grain prices between regions. This means that relative feeding costs for livestock production can be expected to adjust accordingly.

Competitive Advantage

Changes in the cost of transporting feed grain within Canada, other than the Crow Rate portion, have already been occurring at a rapid rate for several years. Ten years ago, for example, the net transportation and handling charges for shipping one tonne of barley from Saskatoon to Granby, Quebec, was just over \$10. By 1982, that cost had more than quadrupled to a level of \$44 per tonne. These and other changes in

grain transportation costs to eastern Canada are shown in Table 2.

Meat transportation charges have been increasing also but generally not as rapidly as grain transportation and handling costs. Consequently, the competitive advantage in hog production, for example, has tended to shift from East to West during the 1970s. This shift is reflected in gross returns over feeding costs for pork production as illustrated in Table 3 for Quebec and the Prairies. In this case, the difference in gross margin from pork production has increased from \$2.72 per market hog in the early 1970s to \$11.77 per market hog in the past three years.

Given this shift from East to West in relative profitability of pork production, which may be indicative of a general trend for all livestock, eastern producers are wondering how that shift may be further affected by ultimate changes in the Crow Rate. This question will be addressed in the next issue.

Table 1. Relative importance of livestock and poultry production in eastern Canada, in per cent of farm cash receipts, 1981.

Product Category	Ontario	Quebec	Atlantic Provinces	Total Eastern Canada
		(% of Farm Cash Receipts)		
Cattle & Calves	24	10	13	19
Hogs	11	22	10	14
Dairy Products	16	35	20	23
Poultry & Eggs	10	11	12	10
TOTAL LIVESTOCK AND POULTRY PRODUCTS	61	78	55	66

Table 2. Net transportation and handling costs for shipping barley from Saskatoon to selected destinations in eastern Canada.

Year	Woodstock, Ontario	Granby, Quebec	Moncton, N.B.
	(dollars per tonne)		
1972	13.08	10.27	10.04
1977	27.16	27.94	25.19
1982	39.23	44.41	50.02

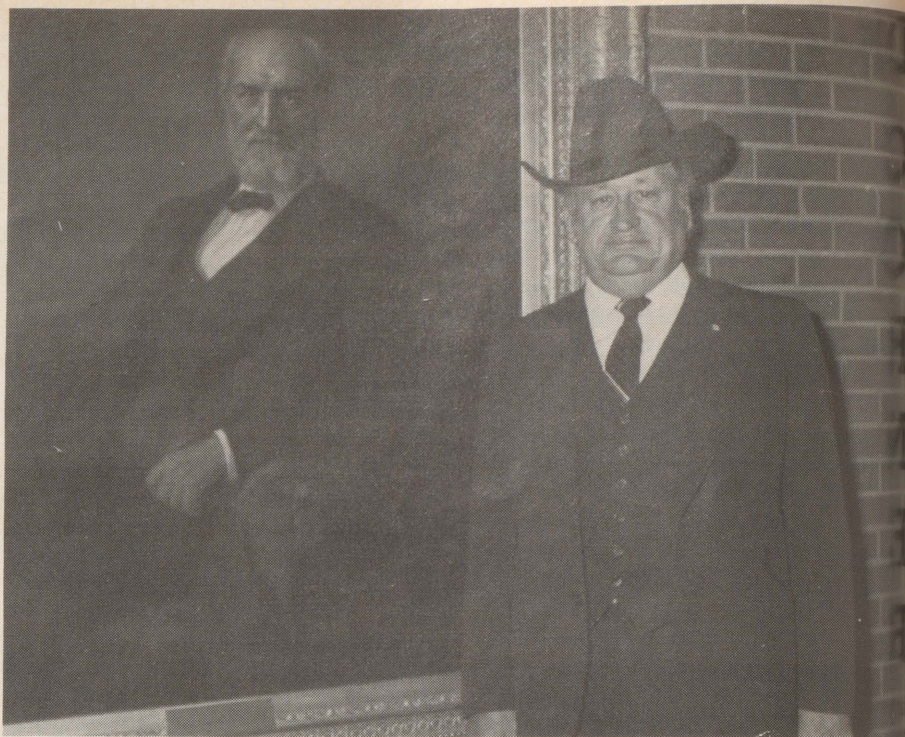
Table 3. Comparative returns over feeding costs for pork production in the Prairies and Quebec, three-year averages, 1973-74 to 1981-82^a

Time Period	Prairies	Quebec	Difference
	(\$ per market hog)		
1973-74 to 1975-76	37.28	34.56	2.72
1976-77 to 1978-79	49.02	38.67	10.35
1979-80 to 1981-82	34.40	22.63	11.77

^a Calculated as the difference between gross returns based on market prices for index 100 hogs, as reported by Agriculture Canada, and feeding costs based on average prices of hog growth (14-16% portion) recorded by the Livestock Feed Board of Canada.

Minister Attends Official Opening

The Federal Minister of Agriculture, the Honourable Eugene Whelan, officially opened the Agriculture Canada Muscle Biochemistry Laboratory on December 14. The lab, affiliated with the Department of Agricultural Chemistry and Physics, is dedicated to research on protein structure. A plaque commemorating the event was unveiled at a ceremony attended by various invited guests, such as Deputy and Assistant Deputy Ministers Connell and Leroux, directors of various Federal research establishments in Quebec, and representatives of the Macdonald-McGill community. Mr. Whelan took time to pose beside a portrait of Sir William Macdonald, and was also given a tour of the lab with G.A. MacIachlan, Dean of the Faculty of Graduate Studies and Research, and Dr. Howard Steppler, Chairman of Plant Science. Dr. Zarkadas, right, Director of the lab, hosted the tour.



Photos by Pierre Levert



(Continued from Page 13)

appropriate inoculum (bacteria) to produce nodules on that species. Although coated seed is relatively new to Canada, it has been used in Australia and New Zealand since about 1950.

It is said that coated seed will establish better on low fertility soils than will non coated seed. In low fertility soils, appropriate nutrients and inoculum may be in short supply, and this may prevent the seedling from

establishing. The coated seed provides lime and nutrients immediately as the seed germinates. In addition, the legume seedling roots will be immediately inoculated by the appropriate bacteria.

Research in Australia and New Zealand has shown that coated seed does establish better on poor soils than uncoated seed. Research in North America has not shown a great advantage for coated seed. Certainly on good agricultural soils, coated

legume seed has shown no advantage over properly inoculated uncoated seed. More studies have to be carried out to determine whether it is indeed worth while to use coated seed on poor soils in eastern Canada. One must remember that coated seed is more expensive. Although costs per kilogram are about the same for coated and uncoated seed, there are fewer seeds in a kilogram of coated seed because of the presence of coating.

DIPLOMA

by Jim Currie
Assistant Director, Farm Practice
Diploma in Agriculture Program

In keeping with the emphasis of this issue of the Journal on dairying, it seems sensible to choose a Diploma graduate who is working with the Dairy Herd Analysis Service. This particular organization is staffed by many of our graduates. One of the best reasons for this is that Diploma students are so closely involved with farming and thus, for example, make ideal field representatives. They can easily communicate with farmers and understand their problems. Another is that through the Diploma Program they have a strong general background on which specialized technical training can be based. In the case of DHAS this means ruminant nutrition initially. This is a must since it allows the field reps (under the professional guidance of Jacques Gilbert, the Nutrition specialist at DHAS) to interpret results and offer help to farmers.

To select one field representative is difficult since most of them exhibit any of the same personal qualities. The good typical example, however, is Diploma 1975 graduate, Terry Winslow from Sherbrooke.

Terry came to Macdonald in 1973 because he enjoyed agriculture. He didn't really know what part. Since his parents didn't own a farm, he knew it could be an up-hill battle to become a farmer. He graduated as an honours student and for the next year he worked for Agriculture Canada, Health of Animals branch in the Port of Montreal. His main task was meat inspection — checking imported shipments for possible disease problems. He left that job in the spring of 1976 because he was losing touch with farming. One knew that to be happy he needed a job that would get him into the countryside, maybe even home to the townships. That's when he called Norm Campbell, Manager of DHAS, to see if there was anything open. Bingo! He couldn't have hit a better time.



DHAS was expanding rapidly, and there was a man needed to fill in in south and western Quebec, including the Lennoxville-Magog area. Almost home.

For a while Terry did all of the English farmers between Farnham and Bury. He picked up enough working knowledge of French to work both sides of the language barrier. Soon he had his own territory: Compton-Lennoxville-Coaticook, and there he is — at home.

Even though the extent of Terry's territory has been cut considerably over the years, he is still on the road a great deal. In an average week he'll drive 500 miles (800 km). Nor has his work load diminished. Part of a supervisor's job is to recruit new farmers. As the number of farms increases the territory may have to be split to keep the supervisor at his manageable work load. Terry has been good in promotions. His territory has been reduced a number of times. Right now he is handling 72 herds on the owner-sampler option and seven official test herds. He enjoys the official herds most, even though they do require a lot more work at odd hours. He feels that he gets much more involved in the whole management system of the farm and that these farmers especially, and all farmers generally, are very aware of what is happening around them.

After 6-1/2 years with DHAS, how

close is Terry Winslow to farming? As a matter of fact, he has already started. In 1980 he bought 104 acres, half woodlot, half cultivated. He also combined with his brother to buy a 113-acre woodlot under the Quebec forestry loan plan. He is not expecting to make a living from his farms for a while, but it gives him a real good hobby. He plans to plant about 20 acres to dwarf apple trees; the rest will be planted to Christmas trees and, through proper management, he will develop a small maple operation. His goal is to have the farm working and paid for in 10 years without carrying a large debt.

Most of Terry's free time is spent enjoying outdoor activities. Wonderful sports such as planting trees, cutting grass, and chain sawing fill his leisure hours. The time he does have free he spends as a Boy Scout leader or as a director of the local English Speaking Townshippers Association. His concern for helping his community to cope with the changes in Quebec led him to this group. Now that he has made it home, he wants to be able to stay.

Life, of course, wouldn't be the same without its ups and downs. In Terry's case there have been off times, but most of it has been up. Take for instance the time he almost had a trip on a helium filled display blimp (borrowed in true Dip fashion in the middle of the night from a ploughing match display). The ups almost came when his partner in crime let go of the rope first. The downs definitely came when he had to pay for the loss of the balloon plus expenses. Another of life's lessons learned. Let's hope that Terry's achievements just keep getting higher like that old balloon.

Another tradition was maintained a few weeks ago. For all who remember, this was the annual trip to the Royal Winter Fair and to farms around Toronto. Anyone who went on these trips will recall how much fun they were. If you graduated in the last 15 years, you will recall two of the farms that we still visit: Harvey Brown in Markham and the Shur-Gain Research Farm in Maple.

While at the fair I bumped into two Dip grads that I recognized: Ross Carson, Dip. '50 and Keith Jerrett, Dip. '81. I apologize to those that I didn't recognize — write to me and let me know you were there.

Starting Garden Plants Indoors

by Professor B.E. Coulman
Department of Plant Science

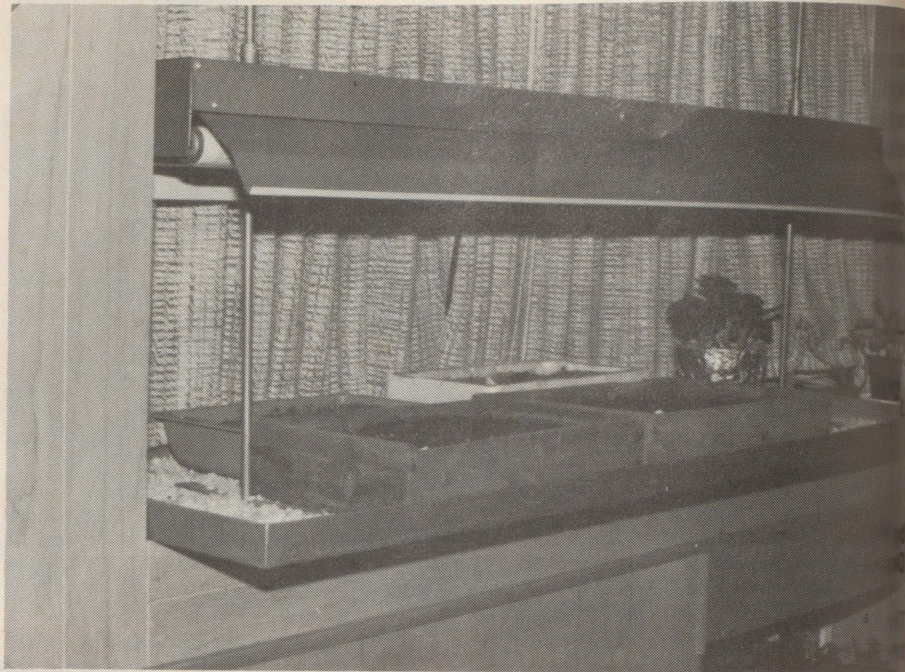
Gardening has become of increasing interest to the general population in recent years. The cost of flats of vegetable and flower bedding plants has continually risen, and persons with large garden areas can spend considerable sums of money each spring. An alternative is to grow flats of garden plants indoors during the late winter and early spring. For the last few years, I have been producing in my home virtually all of the vegetable and flower plants that have been required for my garden. In this article, I will point out some of the important aspects of this production.

Which Plant Species Can be Grown

The majority of the bedding plants seen at commercial nurseries in the spring can be successfully grown at home. This includes flower species such as begonias, impatiens, petunias, and marigolds and common vegetables like tomatoes, peppers, and broccoli. One should start planning the garden early in the New Year and order the required seed in January. I recommend obtaining seed from the larger seed houses such as Perron or Stokes. These companies offer the gardener a much wider choice of varieties and, in general, their seed is of higher quality than that purchased off the shelf in a department or grocery store. The catalogues of these seed companies have a wealth of information on the characteristics and culture of the various species.

When Should Plants be Started

The time to get started varies between the plant species. Small seeded, slow-growing plants like begonias should be started by mid February. Geranium seeds can be planted in January if early summer blooms are desired. A large number of species are normally started around the first week of March. This includes broccoli, cauliflower, petunias, dusty miller, and dwarf marigolds. Fast growing plants, like tomatoes, are usually not started until mid April. Most seed packages



An example of a four-foot fluorescent fixture mounted above various types of flats filled with planting medium.

will clearly specify the recommended time of planting, so the information on these should be read carefully.

Growing Medium and Containers

The seeds of many common garden species are small and produce very fine roots. Thus it is important to use a very porous medium to allow roots to penetrate easily. I find that the prepared growing media such as pro-mix or jiffy-mix give excellent results. These mixes usually consist of fine peat moss, perlite or vermiculite, and a small amount of fertilizer to get plants started. One can prepare one's own medium, but it should not contain too much fine textured soil as this will produce a very hard growing medium which will impede root growth.

There are a variety of inexpensive containers that can be used to grow plants. I normally germinate seed in old margarine containers filled with moist pro-mix. Seeds are spread thinly and pressed lightly into the medium. The containers are covered with plastic to maintain a high humidity in the container. After most seeds have germinated, the plastic should be removed as it filters out a considerable amount of light. When the seedlings

have from two to three leaves they are then transplanted to larger flats. The seedlings are spaced in these flats according to the ultimate size of the plant. The flats may be wooden, plastic, or styrofoam. Most gardeners probably have a certain number of these flats from previous purchases of bedding plants. The wooden and styrofoam types can be purchased from most nurseries at a reasonable price. The flats, which have holes or cracks for drainage, are lined with newspaper before filling with growing medium.

Light

The major limiting factor in producing bedding plants in the home is the amount of light available. If the seedlings do not receive enough light, they will become very elongated. Plants can be successfully grown by a large bright south or west window; however, this sort of space is usually somewhat limited in most houses.

Fluorescent lights are an excellent light source for most bedding plants. Fluorescent fixtures can be mounted on shelves, suspended from ceilings, or may have their own mounts as illustrated in Figure 1. The height of

These fixtures above the flats should always be adjustable so that they can be raised as the plants grow taller. The fixtures should also be equipped with a reflector, as illustrated in the photo, to insure that the maximum amount of light reaches the plants. The lights should be mounted only a few inches above the seedlings as they need as much light as possible. As the plants grow the lights can be raised accordingly.

There are many types of fluorescent

tubes available. I have found that the cool white tubes produce satisfactory results. There are tubes, such as the Grow-lux, manufactured specifically for use above growing plants. These tubes are, however, more expensive, and they produce a red glow which may be undesirable if the fixtures are mounted in a living room.

Final Comments

There is a certain outlay of money

in the first year of production of bedding plants in the home. One may have to purchase fluorescent fixtures, tubes, flats, and so on. These costs, of course, are discounted in future years as one continues to produce bedding plants. In addition to the monetary saving, there is also satisfaction involved in producing one's own plants. Essentially one is starting his or her garden in February which gets one thinking of spring earlier which seems to make the winter that much shorter.

FRUIT TREES

ROOTSTOCK REVIEW

by Professor D.J.I. Buszard
Department of Plant Science

The choice of rootstocks for fruit trees in Quebec is wider than many people realize. Although apples are the only tree fruit grown on a large commercial scale, many farmers are interested in other species for small scale production, and plums, pears, and cherries are grown successfully by many amateurs. For apple trees many rootstocks are available; for pears, plums, and cherries the choices are more limited, but research and testing of new rootstocks continues and more should become available in the near future. The choice of rootstock is crucial to the success of the tree, determining yield, size, and cold hardiness.

Apple rootstocks

Traditionally, apples were grown on seedling rootstocks; now clonal rootstocks are available which are comparable with the varieties grown in Quebec and recommended by the government based on the results of long-term trials:

Malling 9: this rootstock, originally developed in Britain, is a dwarfing stock giving a final tree height of not more than three metres, even on the deepest loam soils. Malling 9 was tested in Ottawa from 1938 to 1970; at Macdonald Campus trees on this stock were first established in 1957 and have survived the past 25 Quebec winters; indeed, they were

unharmed by the severe winter of 1980-81. These trees are in sod; however, at the Agriculture Canada Research Station at Frelighsburg trees in bare ground reportedly suffered some winter injury in 1975-1976 (Rousselle *et al* 1977). Despite this, Malling 9 is one of the rootstocks recommended for Quebec; producing about 35-40 kg of fruit from the fifth year after planting. A new virus-free strain of this rootstock is available, but it is more vigorous and not as precocious as the virus-infected stock.

Malling 26 is a semi dwarf rootstock and is probably the most popular apple rootstock in Canada. It has been widely tested and seems to be harder than Malling 9. Malling 26 produces a tree approximately half the size of a standard tree on seedling roots — slightly larger than Malling 9. Being more vigorous it may require heavy pruning in an intensively planted orchard. Despite this, early yields are good, and it has been more productive than Malling 9 in field trials at Frelighsburg.

Malling 7 produces a tree slightly larger than M26 but still regarded as semi dwarf. This rootstock is widely planted in North America; it seems suited to most soils and climates and can survive the worst management and still produce a reasonable crop. Unlike Malling 9 and 26, Malling 7 does not need a permanent support and can be planted without a stake or

wire framework. Despite its many advantages, in terms of low management requirements and tolerance of adverse conditions, Malling 7 is not usually recommended for commercial planting because yields are not as high as those possible with Malling 9 or 26 and fruit quality may be low.

The rootstock Ottawa 3 was developed at the Ottawa Research Station in 1956 and has been tested since then across Canada. Trees at Frelighsburg have performed well, being intermediate in size between Malling 9 and 26. Yields have been good, the trees producing more fruit than ones on Malling 26 roots despite being smaller (Granger 1981).

Pear rootstocks

Most pear trees sold in Quebec are on seedling rootstocks. They are usually grown from the seed of Bartlett pears and produce vigorous standard size trees which may take up to eight years to come into crop.

Pear production in Quebec is marginal; the most popular scion cultivar "Bartlett" is not truly hardy and attempts to grow it commercially have been unsuccessful. Other cultivars may be grown here: Anjou, Bosc, Clapp's Favourite, and Flemish Beauty are less popular with consumers and, therefore, less attractive to commercial producers. However, they are useful for home consumption and may be grown in a farm garden.

New rootstocks are currently being tested. Some of these may be more hardy than Bartlett and may produce smaller, more precocious trees; as yet, none are recommended.

Cherry rootstocks

While commercial production of sour cherries such as Meteor, Montmorency, or English Morello may be feasible in Quebec, the production of sweet cherries is limited to amateur fruit growers. The most common rootstocks for both types are Mazzard and Malaheb seedling and Mazzard F12, a clonal selection from Mazzard which is more vigorous. None of these rootstocks are dwarfing, but Malaheb produces the smallest tree of the three. "Colt," a new dwarfing rootstock developed in Britain, has not yet been fully tested in Canada but may be available in the future.

Plum rootstocks

Plums have been grown in Quebec for many years; the rootstocks most widely used are wild seedlings or Myrobalan B, a clonal selection from Britain; both of these produce full size trees. Other rootstocks are currently being tested in Quebec and Ontario: The variety Brompton as a rootstock may produce a smaller tree which would come into bearing earlier. *Prunus tomentosa* is a dwarfing species, which as a rootstock produces trees half standard size, but a more promising dwarfing rootstock is Pixie; developed in England, it has not yet been fully tested, but it is thought to be both dwarfing and precocious.

Several plum cultivars are regarded as hardy and suitable for commercial production in Quebec: Mount Royal, Reine Claude, and Damas Bleue.

Many others are excellent for amateur fruit growers or small scale production and could be successfully grown here.

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A visit from H. GORDON GREEN

Two or three years ago a U.S. senator complained bitterly about some of the utter silliness in government publications. A farmer himself, he was particularly incensed about a certain pamphlet on farm safety which cost the taxpayer something over a quarter million dollars. And in this costly piece of literature were such inane bits of advice as these:

"Be careful when around large animals. Cows and horses are quite capable of kicking or stepping on your foot, and even a switching tail can bring serious injury to an eye.

"Be careful when you walk on stable floors which have not been thoroughly cleaned of manure, as such floors may be slippery and can give one a nasty fall."

The pamphlet went on with several pages of equally silly warnings and, according to the senator who brought the publication to the attention of his confreres, there wasn't a thing in the whole book that any honest-to-goodness farmer wouldn't know already.

You think that nothing so ridiculous would ever appear in a government publication here in Canada? Well then listen to this: I have before me now an issue of a newsletter put out by the Ministry of Agriculture for Quebec, and in it I see that certain unnamed "experts" in that department are strongly urging farmers like myself to join a "Beef Cattle Test Program."

To qualify I am advised that for each production year I would first have to "identify calf's sire and date of breeding."

Now let's think about that. To identify the calf's sire would indeed be quite simple for most of us because most of us will run but a single bull with the herd, but date of breeding? Does the government "expert" who dreamed up this program realize what a farmer would have to do to accomplish that? If the bull is let with the herd around July 1, which is the custom with most Canadian beef men to ensure that the breeding calves will be born in the spring and summer and not in the dead of winter, he breeds night and day until every cow in the



herd is finished with romance for another year. Now to record every bull-jump which takes place for the next three months a beef man would have to chaperone said bull notebook in hand and probably field glasses too.

I am not sure that all bulls would be broad-minded enough to welcome such voyeurism, and if mating takes place during the dark (yes, cattle make love in the dark, too), how in the world does the farmer identify the cow?

But let's go on with the requirements of this wonderful new program to help us beef men improve our stupidity. Next spring, when the calves begin to arrive, the farmer is supposed to be on hand for each delivery to witness ease of birth, condition of calf, and its weight! Well as a farmer who has had a herd of 60 cows or more for the past 30 years, I would like to volunteer the information that if a cow is healthy at calving time and if she has the protective motherly instinct she should have, she is going to resent any handling of her newborn calf. Indeed if she is worth her salt, she's apt to knock a meddler arse over teakettle!

In all my experience with beef animals I have yet to meet a bull who showed any inclination to massacre me, but I have had more than one rib busted up by cows who absolutely refused to let me get familiar with their newborn calves.

But suppose I did own cows who

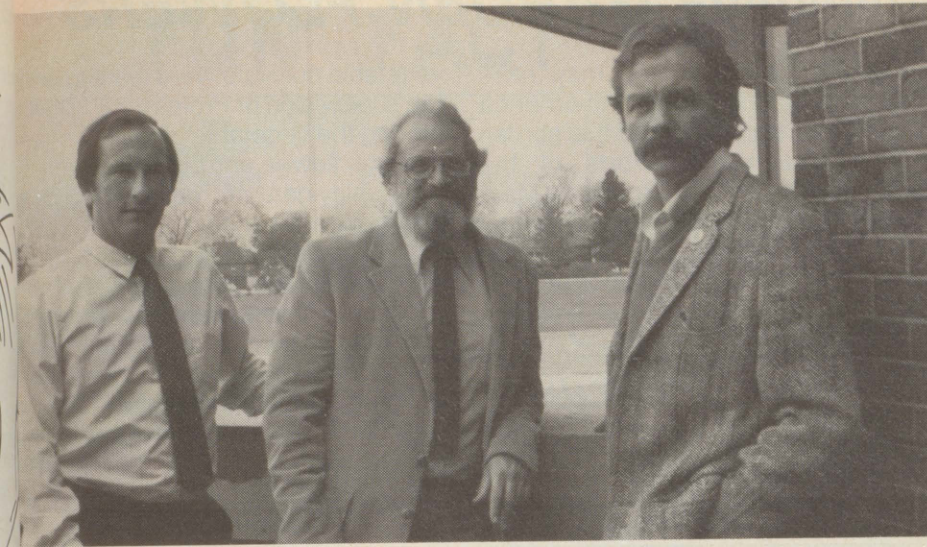
WORLD FOOD DAY

by Professor E. Donefer
Department of Animal Science

The second annual observance of World Food Day (WFD) was held on October 16, 1982, with special programs organized throughout Canada and the world. The overall organization for WFD was provided by the Food and Agriculture Organization of the United Nations (FAO), whose anniversary of its founding in Quebec City on October 16, 1945, serves as the focal point for the annual observance. A joint staff-student WFD committee on the Macdonald Campus attempted to make the WFD observance a major "happening" as the theme so closely parallels the major interests of our Faculty of Agriculture and School of Food Science. The Macdonald 1982 WFD observance covered a three-day period and included a guest speaker, the showing of a series of films on international agricultural development, and displays on Third World foods.

A panel discussion on problems in Third World food production was organized by Mac students from some of these countries. A world food simulation game, developed by several students, proved to be one of the most stimulating and educational experiences for the participants. A fund-raising campaign resulted in over \$400, which was contributed to Oxfam Quebec for support of an agricultural co-operative project in Brazil.

Staff and students participating in World Food Day included, top photo, left to right, Professor Guy Mehuys, a member of the WFD committee, Professor Eugene Donefer, Chairman of the committee, with guest speaker Dr. Michael Scott, Director of Overseas Operations, OXFAM (USA); centre: Linda Currie, of the School of Food Science's Dietetics Program, cooking up some tofuburgers, while Marina Costain of the Community Liaison Program samples some of the "foods from around the world" while, below, France Daoust is seen manning one of the displays in the Centennial Centre.



usted me at such a time — do I lug
set of scales out into the field with
me along with my notebook and
inoculars? Or does the government
gentleman who dreamed this plan up
suppose that these birthings will be
taking place in a maternity ward of
ome sort?

And anyhow, if that calf gets to earth
all right, why worry about his weight?
It's his weight at weaning time that
matters, isn't it?

Besides here on my own farm I
happen to raise Galloway cattle, a
breed celebrated for its rugged
independence. And unless I were

somehow able to get that calf on the
scales almost as soon as his mother
dropped him, I wouldn't be able to
catch him.

I just wonder as I read the rest of the
rules of this plan, how many other
so-called agricultural experts don't
know which end of a cow gets up first!

NEW AWARD WINNING GARDEN FLOWERS

by Professor Calvin Chong
Department of Plant Science

Seed companies around the world spend millions of dollars each year developing new and improved flower and vegetable cultivars (varieties) for your garden. Most of this work is directed to the production of hybrids. The release of a new cultivar culminates many years of research involving test crosses between special parent lines; growing and evaluating test hybrids in the breeders' trial fields; further evaluation of the most promising ones in test plots in university, government, or commercial fields and, finally, seed multiplication and release of only the very best. Several hundreds, and sometimes thousands, of test crosses may be made to find one new cultivar.

Fifty years ago, a group of university and seed company plant breeders formed an association, the "All-America Selections," with the objective of speeding improvement and release of new home garden flowers and vegetables. Today, this association has over 50 strategically located trial grounds and a network of some 150 display gardens at colleges, universities, and public gardens across the United States and Canada. Each year, breeders send seed samples, descriptions, and photographs of new potentially promising cultivars to the association in Willowbrook, Illinois. These are tested or displayed at the official locations and the best ones recommended for multiplication and sale by the seed industry. Testing is rigorous; less than one out of 10 entries qualify. On average only six to 10 make it each year earning the bronze, silver, or gold award depending on the degree of superiority of the entry. Cultivars must be uniform in plant size, blossom and colour qualities, have a good duration of bloom, and be resistant to weather, plant diseases, and pests. Thus, these new superior cultivars must be rugged and possess wide adaptability across North America.

During the summer of 1982, visitors to this Campus may have noticed a small garden area just outside the Macdonald-Stewart Building with an assortment of flowers which bloomed more beautifully and profusely as the

season progressed. You may have also noticed the white "All-America Selections" sign in front of this garden area. Through the efforts of the Department of Plant Science, Macdonald became an official All-America Selections Display Garden. These gardens are usually sent both flower and vegetable seeds of award winners of the coming, current, and immediate past years.

In 1982 the new flower cultivars were planted and cared for at Macdonald by Campus Care. The new

vegetable cultivars were planted under the supervision of Professor K. Stewart among the vegetable plots in the field.

Eight flower entries were sent for our display garden. These included two flower award winners for 1981, three for 1982, and three for 1983. These are described in the accompanying table. The later cultivars are new enough that they may be somewhat difficult to find. Seed, however, should be more easily to come by than transplants. Consult your latest seed catalogue or nearest garden centre.

New All-America Selections

Description

Celosia "Apricot Brandy" Bronze Medal 1981	A soft apricot-orange, this new feathered celosia offers all sorts of possibilities for flower and garden arrangements. Plants reach 35-45 cm in height and spread. These base branching plants are remarkably uniform in size and in number, colour, and shape of plumes.
Impatiens "Blitz" Bronze Medal 1981	The 5.5 cm orange-scarlet blossoms against the lustrous bronze-green foliage provide quite a contrast. Plants are compact, averaging 25-30 cm in height, and spreading to 40 cm. Like all modern hybrid impatiens, "Blitz" usually will tolerate full sun. Also suitable for pots and hanging baskets.
Zinnia "Small World Cherry" Bronze Medal 1982	This is the first of a new class of hybrid zinnias, with dwarf compact plants reaching 30-35 cm in height and spreading 40-45 cm across. The dome-shaped blooms of a most pleasing deep cherry colour average 2.5 cm in diameter and are so numerous they fill every opening in the foliage. Plants always look fresh and clean. Long after foliage diseases and weather stresses have decimated competing varieties, "Small World Cherry" continues to be in bloom.
Zinnia "Fantastic Light Pink" Bronze Medal 1982	Bred primarily for massing in the landscape, this hybrid zinnia produces astonishingly large double blossoms (over 10 cm) for such compact plants. It flowers freely over an extended period and is resistant to weather stresses. The blossom colour does not fade and spent blossoms are covered by new foliage and flowers. It makes graceful pot plants.
Carnation "Scarlet Luminette" Bronze Medal 1982	This is an early, heavy bloomer. The 6-7 cm blossoms are double, semi-fringed, have a bright scarlet shade, and a faint but true spicy carnation fragrance. Deep green, direct plant, average 60 cm in height and spread to 38 cm. A few plants will provide a reliable source of elegant long-stemmed cut flowers that can last up to 10 days in bouquets or arrangements.
Ornamental Pepper "Candlelight" Bronze Medal 1983	A "hot" new ornamental, "Candlelight" grows vigorously but is low (25-30 cm) and spreading, bearing up to 100 or more slender peppers. These burst into flames of red in late summer, hence the name. It performs well in small (15 cm) containers and thus is suitable for balcony gardens. It is heat and sun resistant and produces fruit right up until frost.
Kochia, Variegated "Acapulco Silver" Bronze Medal 1983	The plant grows quickly to 1.0-1.2 m high and spreads to 45 cm. The fern-like, light green foliage is silver-tipped as if lightly hand-painted. More than a graceful summer ornamental, the plant is especially useful as an inexpensive temporary shrub or hedge. In the fall the plant turns maroon, then red, hence its common name Mexican Firebush. These plants do best in full sun.
Petunia, Grandiflora Hybrid "Red Picotee" Bronze Medal 1983	The exciting feature of this new petunia is the blossoms with bright red centres and pure white margins. This represents a vast improvement over other patterned petunias. It blooms early and is uniform in appearance. Also ideal for pots and hanging baskets.

FUN FACT FABLE FICTION

Ralph H. Estey
meritus Professor
Department of Plant
Science

Secret of Success?

A dairy farmer recently retired with a small fortune. When asked the secret of his financial success, he replied: "I attribute my ability to retire with a bank balance of \$107,000 to hard work, seven days a week, for nearly 40 years, and to the recent death of an aunt who left me 200,000."

Saint Valentine's Day

Historians disagree about the identity of St. Valentine. Valentine or Valentinus is the name of a number of saints but the most celebrated ones are those of a priest beheaded by the Romans about AD 270 and a bishop beheaded three years later. Both are believed to have died the same day, hence the feast of St. Valentine, February 14.

The Romans had a lover's feast day or festival, February 15th, the Lupercalia, during which young men chose partners by drawing names by chance from a box. The partners exchanged gifts, and they usually continued to enjoy one another's company long after the festival.

Church authorities tried to give Christian meaning to this pagan festival. In AD 496, Pope Gelasius changed the Lupercalia festival of February 15th to Valentine's Day of February 14th. But the sentimental meaning of the old festival remained.

★ The best mirror is an old friend. — George Herbert (1593-1632)

Birthstones

A birthstone is a precious or semi-precious stone symbolizing the month of a person's birth, once believed to bring good luck and to favourably influence the personality of the wearer.

The birthstone for February is a wine coloured quartz, the amethyst, which means "not intoxicated" because it was supposed to keep the wearer sober. Fortune tellers in the Middle Ages didn't agree on a birthstone for March so we have at least two: aquamarine and chalcedony (bloodstone). Aquamarine is a bluish-green transparent variety of beryl. Chalcedony is a variety of quartz. The greenish kind with small blood-like spots of red jasper scattered through it is the "bloodstone" gem for March. The Bible (Revelations 21:19) comments that one of the foundations of the Holy City was made of chalcedony.

Thoughts, Old yet New

"The rapid progress of true science occasions my regretting sometimes that I was born so soon. It is impossible to imagine the height to which the power of man over matter may be carried... Agriculture may diminish its labour and double its produce... all diseases may be prevented or cured, not excepting that of old age, and our lives lengthened at pleasure."

— Benjamin Franklin (1706/1790)

Household Hint

Heating a lemon in boiling water or in the oven will greatly increase the amount of juice that can be easily extracted from it.

Is Heaven Hotter than Hell?

It is easy to calculate the temperature of some of the hottest spots in hell. Revelations 21:8 informs us that hell includes a "lake which burneth with fire and brimstone." Brimstone liquifies at 444.6°C, therefore a brimstone lake could not be hotter than 444.6°C, otherwise it would vaporize and no longer be a lake.

Presumably there are much cooler areas around these lakes because Saint Mark (9:44) tells that parts of hell will not be hot enough to kill a worm.

Calculating the temperature of heaven poses somewhat more of a problem but Isaiah (30:26). in an indirect reference to heaven, comments that "... the light of the moon shall be the light of the sun and the light of the sun shall be sevenfold, as the light of seven days." In other words, heaven will receive from the moon as much heat radiation as the earth now does from the sun, plus 7 x 7 more, or 50 times in all. Assuming that heaven has an atmosphere and a radiating surface somewhat similar to those of the earth, and using generally accepted formulae for the transfer of energy and radiation, one can determine that the temperature of heaven will be well in excess of 400°C. If there are no nights to cool the surface, then heaven may well be hotter than hell.

★ To me, old age is always 10 to 15 years older than I am. — Bernard Baruch (1870-1965)

Top Onions

One of the most interesting of the true onions is the top onion (*Allium cepa viviparum*) which reproduced itself by means of a mass of bulbils that form in a compact mass in the air on the top of the stem. Eventually their weight bends the stem to the ground where they plant themselves for a new crop in the following season. Because of this peculiar character they are sometimes called multiplier or potato onions. The large hollow stalks of the top onions may be filled with cottage or cream cheese and used somewhat like celery as a canape. The bulbils of these onions are used like those of the common onions, although they are usually eaten fresh, uncooked.

★ No race can prosper till it learns that there is as much dignity in tilling a field as in writing a poem. — Booker T. Washington (1858-1915)

Unwept, Unhonoured, and Unsung

Mr. J. Condom of London, England, invented what the French called "Capotes Anglaises." He marketed his product (made from the blind guts of lambs) with little thought of financial gain but was so mocked and discredited that he had to change his name.

Prof Profile

Dr. Eugene Donefer of the Department of Animal Science was the recent recipient of the Earle W. Crampton Award (see insert). Fellow nutritionist Dr. Sherman Touchburn, also of Animal Science, interviewed Dr. Donefer for the Journal.

Sherman Touchburn *I believe you started life as a city boy.*

Gene Donefer Yes, I was born in the big city of Brooklyn, New York. People are always wondering why someone from the city gets into agriculture! When I was about 15 years old I got a summer job working in southern Vermont, and I liked what I saw so much that my goal was to become a dairy farmer. After high school, I took a two-year diploma-level agriculture course at Farmingdale, Long Island, and quickly learned that by not having a family farm or very much money, it would be very difficult to get into farming. I thus continued in school, taking an undergraduate and Masters degree in the Department of Animal Science at Cornell University and my Ph.D. at McGill and ended up in the research and teaching aspects of agriculture.

Sherman Touchburn *Many Americans who come to Canada return after a few years. You are still at Macdonald. What makes you different?*

Gene Donefer Actually Dr. Crampton had set a precedent having come from the United States and staying 51 years at Macdonald. This is only my 25th year in Canada and at Macdonald. I found that I liked the general atmosphere, working at Macdonald, and things Canadian in general, so my wife and I ended up staying here and becoming Canadian citizens with two of our three children being born here. Of course, there is the negative aspect of the Canadian winter.

Sherman Touchburn *Speaking of the cold weather brings me to my next question: how did you get interested in tropical animal agriculture?*

Gene Donefer The initial interest came from contacts with foreign



Dr. Eugene Donefer of the Department of Animal Science, receives the Earle W. Crampton Award from Dr. W.F. Hitschfeld, Director, McGill International.

The Earle W. Crampton Award

The Earle W. Crampton Award for Distinguished Service in Nutrition is awarded by the Faculty of Agriculture and is given in recognition of significant contributions in the field of nutrition through research and/or service. This year's recipient, Dr. Eugene Donefer, of the Department of Animal Science here at Macdonald, has been honoured for his major contributions in the area of ruminant nutrition both nationally and internationally.

The award is named for Dr. Earle W. Crampton, a renowned nutritionist whose illustrious career on the Macdonald Campus began in 1922 and lasted for 51 years. Students the world over have studied the science of nutrition and its application in the feeding of animals with the help of two famous text books "Fundamentals of Nutrition," co-authored by E.W. Crampton and L.E. Lloyd, and "Applied Nutrition," by Dr. Crampton. He and his colleagues published over 100 scientific papers, and Dr. Crampton also authored countless popular and technical articles of value to farmers and feed industry people.

Hundreds of undergraduates in Animal Science, Food Science, and

Dietetics were taught by Dr. Crampton, and he directed the research programs of 70 graduate students including present Macdonald staff: Dean L.E. Lloyd, Professor F.A. Farmer, and Professor E. Donefer.

Dr. Crampton retired from administrative duties (Chairman of the Department of Nutrition) in 1960 but continued teaching and research until 1965 when he was appointed Emeritus Professor of Nutrition. He continued working with Mrs. Agnes Higgins and the Montreal Diet Dispensary in setting up guidelines for the nutrition of pregnant women. The recipient of numerous honours and awards, Dr. Crampton retired in 1973 and with his wife Ethel returned to their home town, Middletown, Connecticut.

The original idea and initial efforts to establish the Crampton Award came from Martin van Lierop of Rural Extension Services, and it was created under the sponsorship of Dr. Clark Blackwood, Dean of the Faculty of Agriculture. The first recipient of the award was Dr. Rachel Beaudoin, Professeur Titulaire à l'Institut de Diététique et de Nutrition of the Université de Montréal. Dr. Beaudoin received the award in 1973 in

graduate students. My research program in tropical agriculture started in the late 60s when we received support from a Canadian company that was developing sugarcane processing equipment and was interested in the animal feed possibilities of the processed sugarcane. After having an M.Sc. student in St. Kitts, that study resulted in a project in Barbados sponsored by the Canadian International Development Agency (CIDA). Next came another larger CIDA-sponsored project in Trinidad, the Sugarcane Feeds Centre.

Sherman Touchburn *I know you did a complete write-up in the April '82 Journal, but could you give us a thumbnail sketch of the Centre?*

Gene Donefer The St. Kitts and Barbados projects were based on using sugarcane as a forage for cattle and sheep. Since my major research interest in Quebec was in forage

utilization by ruminants, the Caribbean projects were a logical extension. It became very obvious that the tropical countries growing sugarcane had a tremendous potential in using that high yielding crop as a cattle feed and as an alternative to sugar manufacture. The St. Kitts and Barbados projects indicated a good potential for sugarcane-based rations for intensive animal production — beef, lamb, and milk. CIDA was interested in a more comprehensive project in Trinidad and contracted McGill to be their Executive Agent for a five-year period. I was named Project Director and had the responsibility of setting up the Sugarcane Feeds Centre (SFC) starting from scratch. We were given use of land by the Trinidad and Tobago government as a project site and we had to design, build, and construct the Centre and convert land which was not being used for any agricultural purpose to produce sugarcane; and we had to try to demonstrate the technical and

economic feasibility of a system for producing beef and milk using cane as feed — and all this was to happen in a five-year period, from 1976 to 1981. With the active participation of many Macdonald staff members and the SFC staff we were able to do all these things. The Sugarcane Feeds Centre was turned over to the government of Trinidad and Tobago in 1981, and it continues to be operated by local staff with local financial support and encouragement.

Sherman Touchburn *Everyone recognizes that that is one CIDA project that has certainly been successful. I know that Dr. George Dion, former Macdonald Dean of Agriculture who was an advisor to CIDA, made this point on several occasions. It was one project which did what it set out to do within the time limit given.*

Gene Donefer Dr. Dion was quite instrumental, of course, in getting the project started. He was very much concerned that CIDA be involved in projects which were able to demonstrate actual production systems which was the aim of the Sugarcane Feeds Centre. I think we were able to accomplish part of the goal; the real goal will be based on continued work at the Centre and also by people in other countries adopting, modifying, and expanding on the initial results.

Sherman Touchburn *Actually the idea of using sugarcane as feed is something that can be applied anywhere where sugarcane can be grown. I remember that at the Third World Conference on Animal Production that was held in Melbourne, Australia, in 1973, Dr. Eric Underwood, who is a famous nutritionist, made the comment to the assembly that the Barbados project of using sugarcane as a forage for intensive cattle production was a major breakthrough.*

Gene Donefer What we were proposing was that if sugarcane, which is a very high energy yielding crop, was properly used in a ration — this means with a formulation of proteins, minerals, and vitamins — high levels of production could be obtained. Sugarcane feeding was not a new idea as there had been a tradition of using it as an emergency when feed was not

recognition of the work she had done in the advancement of knowledge in nutrition and application of this knowledge to the betterment of man. Beaudoin and Dr. Crampton shared leadership in instigating many new programs and organizations towards these goals in Canada. Others who have received the award are: Dr. Zakory for his key role in the "Nutrition Canada" survey. Posthumously to Dr. Abel Irwin, who had received her D. at Macdonald under the direction of Dr. Crampton and was a recognized authority and researcher in human nutrition at the United States Department of Agriculture in Beltsville, Maryland. She was selected as an awardee on the basis of her research and her publication of valuable

conspectuses of research on protein, energy, vitamin A, zinc, and calcium. Dr. Charles W. Scriver of McGill University and the Montreal Children's Hospital in recognition of the nutritional and diet therapy aspects of his work on inherited metabolic diseases. Last year's award winner, Dr. Milton L. Scott, Jacob Gould Schurman Professor of Nutrition Emeritus at Cornell University in recognition of the major contribution he has made to basic knowledge of nutrition and to the field of poultry nutrition. Highlighting Dr. Scott's outstanding contributions are his publications relating to the role of vitamin E and selenium and their interrelationships.



Donefer, right, in conversation some years ago with Dr. and Mrs. Crampton.

available in the dry season but, since it wasn't supplemented with other nutrients, the results were more like a maintenance or survival ration. Our work indicated that when sugarcane was properly supplemented, it could support higher levels of livestock production than normally obtained in the tropics. I have also been intrigued with the idea that the highly productive sugarcane plant could make a much more positive contribution to human nutrition by providing meat or milk instead of its traditional role as a source of sugar in the human diet. Sugarcane feeding to livestock also offers an alternative to Third World countries whose economies are very negatively affected by the present (and future?) depressed world sugar market.

Sherman Touchburn *Another aspect of your research work has involved developing techniques for improving the usefulness of low quality roughages such as straw and even wood as a livestock feed.*

Gene Donefer When I arrived at Macdonald in the late 50s Dr. Crampton, of course, had already established an international reputation in many areas of nutrition but particularly in relation to developing concepts for the nutritive evaluation of forages. My own Ph.D. research work with Dr. Crampton was based on laboratory methods and other systems for forage evaluation. Out of this I developed an interest in low quality forages and agricultural by-products. Our initial work with sugarcane was actually related to sugarcane bagasse, the fibrous by-product of the sugar factory.

Sherman Touchburn *Bagasse is often used as a fuel to fire the broilers for the sugarcane factories, is it not?*

Gene Donefer The surplus bagasse is a waste product that has often been considered as a livestock feed but is limited in use because of its low feeding value unless it is treated. In fact, one of the largest feedlot operations in central Florida is feeding several thousand cattle on a ration containing bagasse as the only source of forage. They are using treatment methods utilizing sodium hydroxide based on research done at Macdonald

and Agriculture Canada (Ottawa) in processing bagasse.

Sherman Touchburn *Turning to a couple of more personal aspects, I happen to know that you are a bit of a gourmet and also enjoy preparing food.*

Gene Donefer I consider myself a well-nourished nutritionist. I have been particularly interested in Chinese cuisine and like to prepare some meals now and then. In addition to the professional reasons for my being in China for two months last summer, it was of particular interest to go to the source and to enjoy some of the foods as served both in urban and rural situations.

Sherman Touchburn *What took you to China?*

Gene Donefer In the last 15 years my major research experience has centred in the Caribbean. I have also had involvements in Latin America, particularly Mexico, and I spent a year's sabbatical in Cuba in the early 70s. I have been interested in expanding my experience and knowledge in international agriculture and when the opportunity came along last summer to go to China I was delighted. I was part of a team of about 15 Canadian agriculturists working on a contract between a Canadian consulting company and the government of China on a project to increase livestock production in North China — in Inner Mongolia and the Province of Heilongjiang. Of particular interest to me was the dairy industry that the Chinese are developing in Heilongjiang where there are many similarities between the climate, the dairy cattle, and their production and that of ours in Quebec. The area is on the same latitude as Montreal and the major difference in climate is that their winters are colder with much less snow and their summers are drier. Their "Black and White" cattle are very similar to our Holsteins, and they have a major interest in increasing corn production to provide silage for winter feeding.

Sherman Touchburn *You also went to Africa recently.*

Gene Donefer I participated in a workshop that was held in Kenya which was organized by the International Development Research Centre (IDRC), a Canadian-based operation. It was a workshop for African researchers on the use of agricultural by-products and low quality feeds for animal production.

I took the opportunity to make stops in Egypt and also in Ethiopia where I spent a week at the International Livestock Centre for Africa (ILCA). One of my former graduate students, G. Mosi, who came to Macdonald from Ghana in the early 60s to do his M.Sc. then went on to the States to get a Ph.D. degree, has been working in Ethiopia for some five years as a nutritionist at ILCA. We discussed the possibility of collaborating in studies between McGill and the Centre. One of the interesting aspects of visiting and working in other countries has been that I have been able to do this in collaboration with former Macdonald students.

Sherman Touchburn *You mentioned your children earlier — are any of them still at home?*

Gene Donefer Our three children are scattered in Montreal, Toronto, and Los Angeles. My wife Vera is an artist who has been very involved in teaching crafts. When Vera is able to travel with me, we try to combine the agricultural aspects with an opportunity to see and collect different types of local crafts. We both have had a long standing interest in folk music which goes back to our high school days, and travelling has allowed us to expand our knowledge of the customs of different countries. I believe that one of the most interesting aspects of travelling in addition to being able to make a contribution, is to see how much you can learn about the culture and history of the countries you visit. This has been one of our goals.

Sherman Touchburn *What is coming up next?*

Gene Donefer After my five-year involvement with the Trinidad project I am now expanding my teaching and research program on the Macdonald Campus, with possible continuing involvement with international projects.

Top Students Contribute to the Success of Macdonald Programs



Peter Knox, President of the Macdonald Branch of the McGill Graduates' Society, had the very pleasant task of presenting Entrance Scholarships to, left to right, Denise Bissonnette, a General Agriculture student from Vaudreuil, Susannah Morton, an agriculture student from Rexton, N.B., Rena Popielnik from St. Laurent, and Sharon Terada from Orleans, Ontario, both Dietetic students.



The Class of '53 Book Prize was presented by Peter Knox to, left, third year Dietetics student Louise White of Willowdale, Ontario, the Macdonald Collee Alumni Bursary to, centre, Pascale Tremblay, a second year Plant Science student from Alma, and the Class of '53 Book Prize to Marie-Pierre Lefrançois, a plant science student from Baie d'Urfé.

Every graduate will agree that "good students" are an essential ingredient for a successful and stimulating college or university environment. But they will also admit that that is only one side of the coin. The work of the faculty and staff is the key attraction to students considering university studies. Happily, Macdonald has more than its share of outstanding research staff and fine teachers. It remains to encourage excellence in general at Macdonald by constantly being alert to opportunities which will bring top

students to the Campus. For many years, the Macdonald Branch of the McGill Graduates' Society has offered selected prizes, awards, and entrance scholarships to assist good students and to attract the best students.

The value of the entrance scholarships has been proven and Macdonald graduates have sustained this feature of their support with increasing enthusiasm. At the Annual Scholarships Awards night, Peter Knox, President of the Macdonald Branch presented this year's Alumni

Entrance Scholarships and was delighted with the recipients. It is very impressive to meet these young people and to learn of their sincere interest in meeting the challenges in education today to form their own career study program.

These and other scholarships are tangible evidence of the opportunities by which alumni enhance the learning experience at Macdonald. These are our graduates of the future who, we hope, will point the way for many Macdonald classes to come.



A plaque dedicating the Students' Lounge to Jean Vauthier was unveiled by, left to right, Paul Jensen, CC Chairman 1981-82, Bob Robson, the first Students' Society President with whom Jean Vauthier worked, and Kevin Boushel, President for 1981-82.



Class of '65 students, left to right, Roberta McKinney, Alex McKinney, Bob Robson, and Doug Avery presented Jean Vauthier with one of the gifts which she received during the evening.

"PUT YOUR BEST FOOT FORWARD"

The novel techniques of the students at Macdonald in reaching the elusive job market have caught the interest and support of the Macdonald Alumni Association and the Dean of the Faculty of Agriculture.

At a recent alumni meeting, Dr. Lewis Lloyd distributed copies of the current publication designed to introduce the 1982-83 graduates to prospective employers. This attractive Students Society booklet was edited by environmental biology student Martin Boulanger and provides informative description of each major study program and a thumbnail sketch plus photograph of each graduate of the Class of 1983 and pertinent career interests and experience.

Dr. Lloyd sees this as a useful student project which also encourages feedback from potential employers and complements the efforts of the Canada Manpower office at Macdonald coordinated by Françoise Gillan. Graduates who would like to receive a copy of the publication should drop a note to the editor of the Journal.



George Shaw, B.Sc. (Agr.) '66, M.Sc. (Agr.) '68 and his wife Barbara enjoy meeting old friends.

A Reception and Presentation

Paul Jensen, B.Sc. (Agr.) '82 who is now working towards his Masters in the Department of Plant Science and who was the CC Chairman 1981-82, and Jean Brown, CC Secretary, helped to organize a Students' Society Reception and Presentation for Mrs. Jean Vauthier who retired from her position as Secretary-Treasurer of the Students' Society. Former graduates and wives, friends, and present staff and students turned out for a most enjoyable evening.

Anniversary Class Gifts: A Pleasant Reminder

Many classes have planned lasting gifts to Macdonald on the occasion of a special anniversary. The Class of 1951, led by William Ritchie, a current Regional Vice-President of the Graduates' Society, made a unique contribution in support of the Macdonald Agriculture Campaign, and in 1980 for their 25th anniversary, the class of 1965 donated a grove of trees to assist in "campus care." The gift was acknowledged with an engraved plaque installed in the area of the tree-planting as a reminder to the campus community of the thoughtfulness and concern of Macdonald graduates.

Looking ahead to Reunion '83, Pat Reynolds and a committee of Doug and Barb Pashleigh, Moe and Pat Gerard, Bob and Terry Heslop, Eric and Jackie Bouffard, Neil Hanna, and Doug and Barbara Logsdail is working towards a gift project for their Alma Mater with the objective of announcing the extent and purpose of their efforts with a presentation to Dr. Lewis Lloyd during Reunion '83.

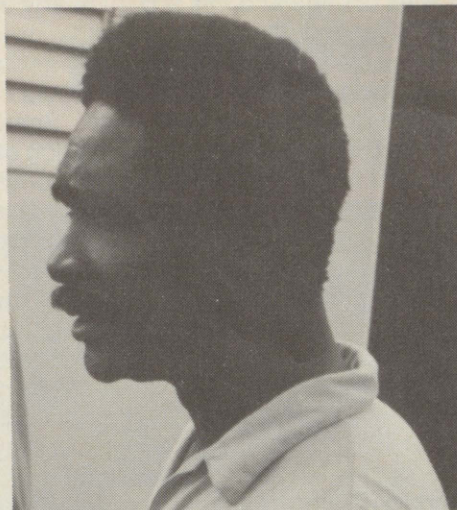
Macdonald Graduates in the Caribbean

Professor J.E. Moxley Department of Animal Science

is always a pleasure to visit the Caribbean and meet a few of the many Macdonald graduates.

In Jamaica, Jim Donaldson, Agr. '77, is now retired after 25 years with the Ministry. He is still very active in a number of activities including a weekly radio show on vegetable growing. E Hendricks, Agr. '55, is Manager of the Jamaica Agricultural Development Corporation which manages a number of estates and is very active in Jamaican agriculture. Keith Roach, Agr. '59, Ph.D., '65, is director of the Agricultural Credit Bank of Jamaica and thus still has considerable interest in Agriculture. Another graduate, Owen Dixon, Agr. Eng. '79, with Alcan's Agricultural Division which includes operations with over 1000 head of beef and dairy cattle. Phillip Webster arrived at Macdonald in January from Alcan to commence a course in Animal Science.

In Barbados, Robert Quintyne, Agr. '63, M.Sc. '72 and Harold Patterson, Agr. '65, M.Sc. '68 are nutrition and dairy cattle specialists, respectively, at the Barbados Ministry of Agri-



Mr. Sam Howard

culture. Harold Patterson accompanied us to Guyana, St. Lucia, and Antigua.

In Trinidad, Sam Howard, Agr. '65, M.Sc. '68, recently returned from France with a Ph.D. in Animal Genetics and is now Head of Animal Research for the Ministry. Horatio Nelson, Agr. '67, M.Sc. '72, is Director of Livestock Production. They toured us through their dairy cattle research facilities and to a number of dairy farms. Leela Rastogi, M.Sc. '83, is busy as a production recording of-

ficer located at the Ministry Aripo Research Station. Haymchal (Harry) Harricharan, Agr. '65 has completed a Ph.D. at U.W.I. and is now CARDI (Caribbean Agriculture Research Development Institute) Chief Animal Scientist for Trinidad.

During a three-week, six-Island tour we had the pleasure of having a Proverbs as a guide. Jerry Proverbs is a Manitoba graduate with CARDI in Barbados (the home of the Proverbs tribe). He informs me that Desmond (Jinx) Proverbs, Agr., '44, M.Sc. '46, Ph.D. '52, has now retired from the Research Branch in Summerland, B.C., and he and Mrs. (Muriel Peart, H.Ec. '47) Proverbs split their time between B.C. and Barbados. Hugh Proverbs, Agr. '48, M.Sc. '50, is in Malawi, Africa; however, he will spend a year on leave in Barbados commencing in April, 1983.

A brief telephone call to the Bovell family in Trinidad indicated that they are all healthy. George, Agr. '45, is on a second term as Senator and still very active in agriculture with his wife (Peggy Mills, H. Ec. '44, M.Sc.(Agr.) '46) and two sons which includes Richard, Agr. Eng. '79. Their two daughters, Jennifer, Agr. '68 with her husband Hugh Avery, Agr. '68, M.Sc. '70, and Donna, Agr. '69 (Mrs. Pollard) are also back in Trinidad.

Financial Constraints Give Renewed Purpose to A.M.F.

Several Macdonald graduates have been appointed to form an A.M.F. committee to direct and promote the annual Alma Mater Fund project in support of the teaching and research programs of Macdonald. Committee chairman, Larry Johnston, Sc.(Agr.)'74, reviewed with colleagues Harold Blenkhorn, Sc.(Agr.)'50, and James Wilding, Sc.(Agr.)'54, the initial plans for the A.M.F. for 1983. In view of the fact that regular operating budget expenses of Macdonald are covered by the Quebec Government grant, contributions to the A.M.F. are encouraged for such projects as scholarships to attract top students. Various services to offset the effects of inflation on costs in this area, campus beautification, student loan funds, and general faculty development.

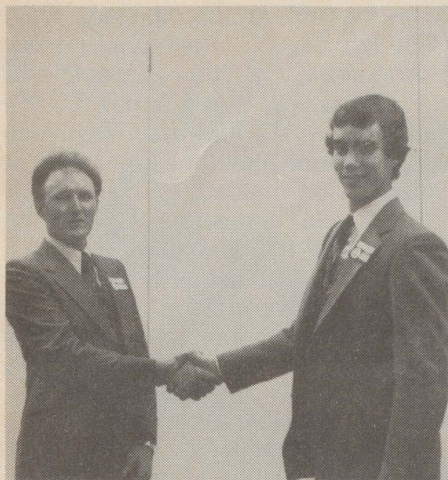
An excellent college will provide education that can lead to employment, but it must also provide

knowledge for now and for the future. "Macdonald has a commitment to study and research programs of world-wide and practical significance," noted Larry Johnston, and he added, "The Macdonald A.M.F. continues to provide to the Dean of Agriculture and his staff the moral and financial support which gives important encouragement to the good work of the College." Although everyone agrees that "times are hard," Larry Johnston believes that "It is in the most difficult of times that we come to understand ourselves and our priorities better than we do when everything is going well."

The traditional interests of graduates for support of Macdonald are still foremost on the Dean's list. Dr. Lew Lloyd explained to a recent Macdonald Branch meeting that "The re-development of the campus continues and 'campus care' is of mutual concern." He added that

"Some of the study and research programs of Macdonald are unique in Canada and warrant support. This can be in the form of the graduates' entrance scholarships, prizes, student loans, library or faculty projects."

This is the half-way point for the A.M.F. for 1982-83. The committee is planning an additional mailing in March, and a Montreal phonathon on Monday, April 11, 1983, as a follow-up. The phonathon is a more practical approach in that graduates can usually receive up-to-date information on Macdonald and some guidance in the nature of the support they may wish to offer. "We are setting our sights on informing all of our graduates of the opportunity to provide financial assistance to fund special projects and hope they will consider joining about 1,000 contributors to the A.M.F. and give us both an improved response and a substantial increase in participation."



Stuart McDonald Memorial Award

Mr. John Hoskin, of Farnham, a second year Diploma in Agriculture student was the first recipient of the Stuart McDonald Memorial Award which was presented at the Scholastic Awards Banquet last November. Stuart McDonald, son of Ranald V. and Geraldine McDonald of Lancaster, Ontario, died at the age of 35 on November 22, 1981. Stuart was a Diploma graduate in 1966 and a B.Sc. (Agr.) graduate in 1971. At the time of his death he was vice president in charge of sales for Slack Bros. of Waterloo, Quebec, a large mushroom growing corporation. The Memorial Award, established in his memory, will be given to a Diploma or Degree graduate on an alternate year basis. The Award was presented to John Hoskin by Stuart McDonald's brother Robert who operates the home farm with his father.

BRANCH GRADUATES RETURN "GOLD KEY" TO COLLEGE

Times change and this is particularly true with student activities. The Fall Royal has changed, the "Mac" newspaper is different, the hub of the campus is the Centennial Centre; in fact, the newest feature is the campus itself! It is not surprising, therefore, that the "Gold Key Society" (and its sister organization on the downtown campus, the "Scarlet Key") has changed over the years.

Now, in recognition of the tradition of the Gold Key and the contribution which its members made to the quality of life at Macdonald through the years, the Macdonald Branch has agreed to spearhead the return of the Gold Key Award to Macdonald. Faculty representative on the Board, Dr. Hans Hueckel, coordinating a committee involving the Students' Society and Centennial Centre representatives to be organized by the alumni, which will annually determine those students whose contribution to the promotion of student participation in extra-curricular activities at Macdonald are exceptional. These students will be presented with the "Gold Key Award" in recognition of their leadership in student affairs. "Important encouragement for this project has been received from the Graduates' Society of McGill University," Dr. Hueckel pointed out. He expects this plan will result in a different format for the Gold Key, but it will strengthen and maintain the original objectives of the Gold Key program.

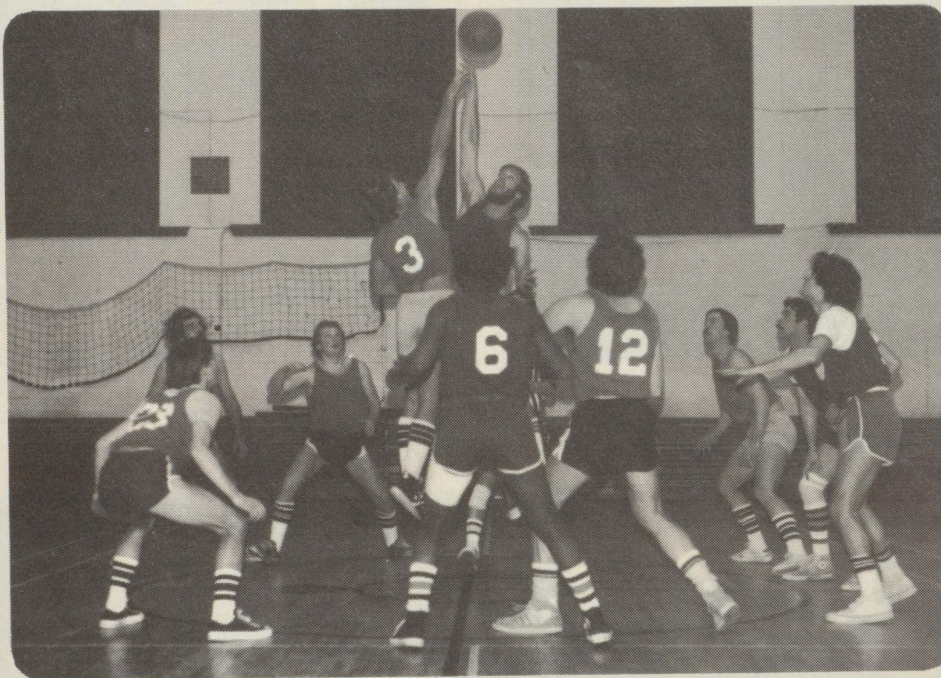


Pin Ceremony

On Wednesday, December 8, 1982, the annual snowstorm and fourth dietetics pin ceremony took place at the Centennial Centre. Nine dietitians and staff from health care institutions affiliated with Macdonald joined Dr. L.E. Lloyd, Dean of the Faculty of Agriculture, Dr. S. Webster, Director of the School of Food Science, Linda Currie, University Coordinator for Professional Practice in Dietetics, and guest speaker Health Canada's Nielsen from the Federal Department of Health and Welfare, in congratulating the 25 new dietitians who received their professional pins. Left: Professor Diane Raymond presents the Macdonald Dietitian Pin to Miss Martha MacLean from Lennoxville. Miss MacLean was the class representative who addressed the dietitians and guests attending the ceremony.

MACDONALD ATHLETICS: FUTURE

Part III



by W.R. Ellyett
Director, Athletics Department

In the past two articles we have dealt with the history of the Athletic Department as well as its current philosophy regarding its role in student life at Macdonald. In this last part we want to take a look at the future of Macdonald Athletics.

The Athletic Department is a part of Student Services and thus is dependent on the following factors: student numbers, student policy, and government subsidies. The student numbers have reached their peak and are forecast to make a slight drop in the future. The student involvement in Macdonald athletics, from a policy point of view, has been a positive and supportive one. The government, as it has been doing recently, is streamlining and this is also expected in student subsidies. These three areas are vital in planning for the future of the Athletic Department.

There is very little room for intercollegiates which are solely funded by the Athletic Department. If intercollegiates are to exist at all at Macdonald, then there will have to be alternate funding. This could be in the form of special funds, alumni help, or money from the pockets of the students involved. The latter is happening now at Macdonald, and, in the future, if intercollegiates are to continue, more of the money must come from the three areas.

The instructional program will continue to grow and expand at Macdonald. This program is of tremendous interest to all students as it gives them an opportunity to experience an activity that they will keep with them when they leave university. The instructional program, from the administrative point of view, is also very popular. The main reason is that it is either a break-even or profit-making program.

The recreational and intramural programs will continue as they have in the past. The recreational program is low cost with only equipment and facilities being necessary. The intramural is a must to promote spirit and competition among the students at Macdonald.

Over the last number of years, Macdonald has begun to renovate its athletic facilities. It still has a long way to go, but the effort has been made and McGill has agreed with our long-range plan. The importance of good facilities is vital in our future programs. Macdonald, in the future, will try and offer its students what they want but will do so in a way that will keep its Athletic Department an efficient and well-run organization.



FIELD DAY DEMONSTRATION — MORGAN ARBORETUM —

by Professor A.R.C. Jones
Department of Renewable
Resources

The annual Morgan Arboretum fall field day, forestry equipment demonstrations and sale of handicrafts made by the Association's volunteers was held on a sunny Saturday in late November at the Conservation Centre. New and old forestry tools and equipment were demonstrated to many visitors including the Agri-Winch tractor-mounted log skidder courtesy of Forano AG., the Ackja self-powered cable winch which can operate on terrain too rough for a farm tractor (courtesy of Zepoli Canada Inc., Pointe Claire). Homelite-Terry Textron demonstrated several models of their chains saws and brush cutters and showed their line of small garden tractors. Small forestry hand tools, pruners and cutters were exhibited by Alan Carmichael of Caverhill-Learmont, Montreal. The Arboretum staff demonstrated its long-burning wood stove (Riteway), and several visitors tried their hand at bucking up logs and using the different wood-splitters available for trial. Urban and private forestry information was presented during the day.

Shortly after the field day, Homelite-Terry, a division of Textron Canada Ltd., presented \$2,500 in sup-



port of the Morgan Arboretum Association. This is the second year the company has made a generous gift to help the Association continue its program.

The Arboretum Volunteers acted as hostesses at the Conservation Centre, serving light refreshments to members and selling nature handicrafts. Many different types of handicrafts were made during their fall work sessions; these included dried flower arrangements, Yule logs, ski tuques, window hangings, cards,

book marks, hasti-notes, and wood plaques all using pressed flowers and Christmas wreaths made from various cones and nuts. These together with a collection of living plants donated by members and friends as well as maple syrup produced in the Arboretum were offered for sale during the Field Day. The proceeds of the sales are to be used to improve the Conservation Centre for the teaching of conservation to youth groups and as a meeting place for members.

Seeking Solutions

corn production for forage also improve soil quality? **Professor Guy Huys** of the Department of Renewable Resources is studying corn production methods with an eye to improving soil workability and tilth and reducing soil compaction. Green manure crops in the corn rotation could alleviate soil degradation while allowing for maximum land use for crop production. This system might also allow the extension of corn production to marginal lands. And if a green manure crop is chosen, fertilizer N may be rescued. These are potential benefits that Professor Huys and graduate student **Rod MacRae** are investigating.

Age preservation and quality — do feed additives help? To what extent are proteins degraded with a loss in feeding value of the forage? **Professors Bruce Baker and Inteaz** of the Department of Agricultural Chemistry and Physics are studying these questions using laboratory microscopes. Chopped corn and alfalfa will be sealed and the effect of microorganism activity (or lack of it) on proteins and their degradation products will be studied over time. The effect of mould inhibitors, bacterial cultures, antioxidants, and enzyme additives on proteins and forage quality will also be determined using the miniature silos. Using these techniques, the silage process can be followed almost daily, and techniques for producing top quality silage can be pinpointed.

Professor Elliot Block of the Department of Animal Science is looking at ways to increase roughage intake by cattle in order to reduce the need for grains and oil seeds. However, the intake of roughages is limited by the size of the reticulo-rumen, and increased voluntary intake by the animal will require increased throughput of the roughage. One factor that may control passage of roughage or feed through the rumen is the rate of bacterial attachment to the roughage particles.

Bacteria will reduce the size of the particles and thus accelerate their passage through the rumen. Roughage to which bacteria attach rapidly will be processed rapidly. Professor Block hopes to find out what properties of forage are most important for bacterial attachment and, eventually, what can be done so that forages will pass through the rumen rapidly, thus reducing the need for grain supplements.

Water runs out of subsurface drains in wet periods, but can it be pumped into the drains during dry spells to provide subsurface irrigation? **Professor Robert Broughton**, Department of Agricultural Engineering, feels that this idea has enough promise to warrant further study. By placing control chambers in subsurface drain collectors, it is possible to pump water into the drains during dry spells. Some of the flat sandy soils near St. Hyacinthe are slated for study. The first experimental controlled drainage

and subsurface irrigation experiments have been established on a farm near St. Louis de Yamaska. If Professor Broughton's estimates prove correct, over 100,000 hectares of flat land could produce better crops through controlled drainage and irrigation. Sub-irrigation costs would be only about 10 per cent of the cost of other forms of irrigation.

Dramatic regional shifts in Canadian pork production in the 1970s have affected Quebec, as our production has increased at a breath-taking rate. Is this a result of the effects of integration policies, marketing systems, government programs, or opportunity costs? **Professor Garth Coffin** of the Department of Agricultural Economics hopes to identify some of the factors responsible for the regional shifts in hog production. The results of his study should have major implications for the hog industry, not to mention the support systems.



ORNITHOLOGY OWL-BANDING EXPEDITION

One of the highlights of Professor Roger Titman's fall Ornithology course is a weekend field expedition to Prince Edward Point jutting out into Lake Ontario west of the Bay of Quinte. This trip scheduled in mid October coincides with the migration peak of tiny Saw-whet Owls. Two nights are spent tending mist nets while participating in a study sponsored by the Kingston Field Naturalists. During the dark hours of October 22 and 23, 1982, 12 members of the class helped as 87 Saw-whet Owls and three Long-eared Owls were captured, measured, banded, and released.

The unique land formation funnels migrating birds to the Point from which they hop from island to island across a relatively narrow expanse of water to reach New York State and continue southward.

AN INTRODUCTION TO



by M.E. Jennaway-Eaman
School of Food Science

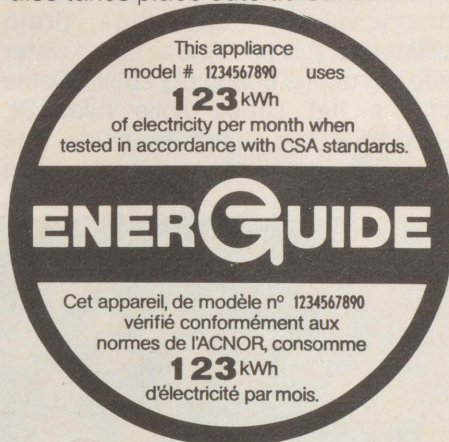
Most people have seen the initials C.S.A. on a variety of products that they have purchased from hockey helmets to electric kettles, but not many people know exactly what C.S.A. stands for, how it operates, and who may become involved.

The Canadian Standards Association (C.S.A.) was originally incorporated in 1919 as the Canadian Engineering Standards Association. Its primary purpose was the development and maintenance of industrial standards, and it was the first private sector organization of its kind in Canada. Today, C.S.A. is still an independent, non profit, national association, but the standards are no longer written exclusively by engineers who design and build the products. Nowadays there is also major input from those who use the products.

Apart from the 2,300 corporate sustaining members, there are over 3,500 other committee members who serve voluntarily and are drawn from consumer, professional, and trade associations as well as from government, research organizations, labour unions, manufacturers, and universities. Committee members write, monitor, and revise C.S.A. standards.

There are now 3,000 standards in existence in Canada, 1,000 of which are published by C.S.A. C.S.A. standards cover 35 major technological fields including: electrical appliances, sporting goods, protective work clothing, medical devices, fuel burning equipment, kitchen cabinets, computers, and plumbing products. The standards are concerned with safety and, in many cases, the performance requirements of a wide array of products and services which are essential in our society. For example, electricity is standardized across Canada so that an appliance which works in Victoria will perform equally well in Newfoundland. If every electrical distribution centre had been allowed to select its own voltage, there could have been no mass production of light bulbs and other electrical goods.

More than 600 million items sold each year in Canada carry a C.S.A. certification label¹. This means that each item complies with the standards established by C.S.A. Exhaustive testing is carried out to ensure that products meet and continue to meet regulated standards. C.S.A. has offices and laboratories for testing and certification in five major Canadian centres: Montreal, Toronto, Winnipeg, Edmonton, and Vancouver. Recently new facilities were opened in Pointe Claire, Quebec, and visitors were able to see the extensive testing to which products are subjected. Inspection also takes place outside Canada in 41



nations and over 9,000 factories which produce goods for the Canadian market¹. If a manufacturer wishes his product to carry the C.S.A. stamp, he must submit it for testing. Two-thirds of the C.S.A. standards are entirely voluntary but are sought after by manufacturers and suppliers for a variety of reasons: to gain market acceptability; to provide criteria for product design, evaluation, and testing; to improve product quality and safety control procedures in manufacturing¹. The other one-third of standards under C.S.A. jurisdiction have been made mandatory by either the provincial or federal government or both.

Contrary to popular thought C.S.A. is not part of government, but it does co-operate with both provincial and federal governments to create, test, and support regulations, especially those governing safety. In British Columbia, workmen's boots with a steel toe cap must pass C.S.A. standards on safety footwear. A

federal regulation requires that hockey helmets sold in Canada meet C.S.A. specifications.

C.S.A. can also provide help in the implementation of some national policies, especially in the field of energy conservation. The C.S.A. has been working with the federal department of Consumer and Corporate Affairs testing the energy efficiency of all models of household refrigerators, freezers, dishwashers, electric ranges, clothes washers and driers for sale in Canada — over 70 models in all. The Department's ENERGUIDE program requires that each appliance carry a label stating monthly electrical energy consumption. This allows the consumer to compare the energy requirements of different models when selecting a new appliance. The program started five years ago with refrigerators and since then the energy consumption has been reduced by over 20 per cent. There is a mandatory control of the electrical energy usage of appliances, and manufacturers have realized that to stay competitive they must provide more efficient appliances.

C.S.A. is hoping to extend testing to electrical water heaters and heat pumps, and maybe in the future to the energy efficiency of houses might be rated under standards now being developed by a C.S.A. committee.

A C.S.A. committee is typically composed of manufacturers, researchers, government officials, and professionals who have expertise in a particular field. In the last six years consumer representation has been increased by the establishment of three consumer advisory panels located in Toronto, Vancouver, and Montreal with a total of 200 members¹. Each panel meets five times a year and has a mandate to review all C.S.A. standards affecting consumers. The Montreal group functions bilingually and meets during the winter months. Panelists such as myself are provided with background information ahead of time and then discuss, with a panel of experts, ways in which a product could be improved from a consumer's viewpoint. Recommendations which are passed



The official opening of the Visitors' Centre at the Morgan Arboretum took place on November 25th. Construction of the new facility was funded by Consolidated-Bathurst Inc., to "mark 50 years of activity as a corporation in Quebec." Above, left, Mr. W.I.M. Turner, Jr., Chairman and Chief Executive Officer of Consolidated-Bathurst, Inc., left, and Mr. R.W. Carswell, President of the Arboretum, perform the unveiling ceremony. Below left: Invited Arboretum members and guests including, to the left of the photo, Dr. L.E. Lloyd, Vice-Principal of Macdonald, and Conrad Harrington, Chancellor of McGill, gather outside the Centre for the tree (a sugar maple) planting ceremony (above) performed by Mr. Turner.

a majority vote are recorded and used on to appropriate committees Wendy Butler in Rexdale, Ontario, is the consumer co-ordinator and acts as the liaison between the specialists and the C.S.A. committees. One of the products reviewed last year included electrical panel boards, gas heaters, and electrical lifting devices for the handicapped.

Any concerned consumer may ask to participate in a consumer panel, and efforts are made to have as diversified a group as possible. C.S.A. welcomes

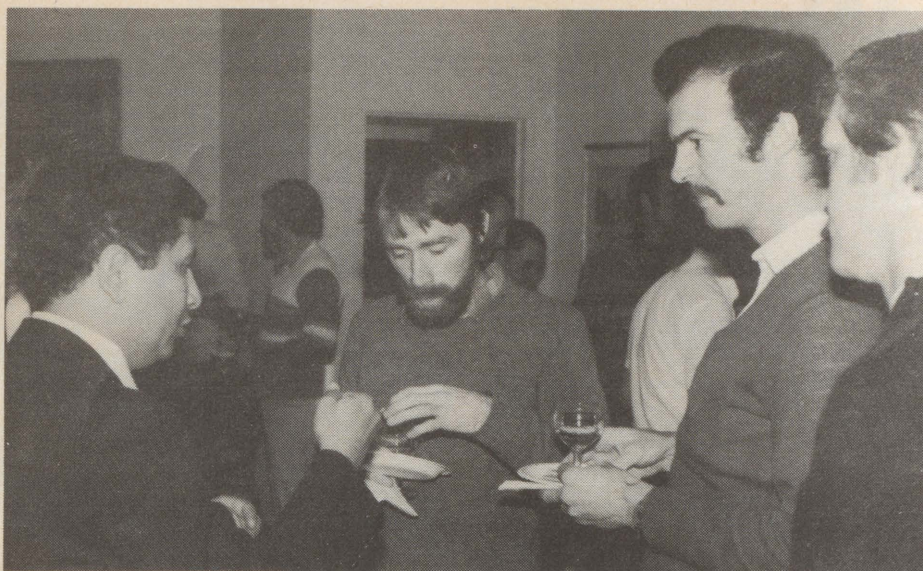
questions from consumers, as well as complaints, particularly if an article it has certified has malfunctioned. Another service to consumers provided by C.S.A. is a newsletter called "The Consumer" which is published quarterly. It contains brief articles, readers' letters, and information from C.S.A. about product changes, both problems and improvements.

In conclusion, C.S.A. committees seek to create standards which provide safety and performance whilst

allowing the fullest possible choice for the consumer and not placing unreasonable restriction on the design and marketing freedom of the producer. For further information about C.S.A. and Consumer Panels, contact Wendy Butler, 178 Rexdale Boulevard, Rexdale, Ontario M9W 1R3.

Reference

¹Standards FORUM, C.S.A. 1982



At the reception following the information session given by Dr. V. Amer of the Dairy Bureau of Canada are, left to right, Dr. Amer, John Conway, Food Science graduate student, and Professors Guy Paquette and Bill Marshall of the Department of Agricultural Chemistry and Physics.

DAIRY BUREAU OF CANADA

by **Professor Guy Paquette**
Department of Agricultural Chemistry and Physics

On Friday, December 10, 1982, Dr. V. Amer, Vice-President, Scientific Research Service, Dairy Bureau of Canada, was on the Macdonald Campus, holding a special information session for Faculty members.

Dr. Amer is no stranger to Macdonald. He obtained a Ph.D. degree here (in Animal Science) in 1971, in the field of Lipid Biochemistry. From 1972 to 1973 he was Assistant Professor at the Université Laval, with research interests in nutritional biochemistry (with emphasis on copper, selenium, and vitamin E). From 1973 to 1981 he was Quality Control Manager and later Vice-President of the Gay-Lee Food Technology Division, where, within five years, he established a well-recognized research laboratory in dairy products with a technical staff of 30 to pursue product development and quality assurance.

Dr. Amer joined the Dairy Bureau of Canada in 1981 to establish a Division of Scientific and Clinical Research on positive/negative aspects of dietary dairy products.

On December 10, Dr. Amer briefly outlined the organization of the Dairy Bureau, a non government operation dedicated to promoting the sale and use of Canadian dairy products. More specifically, he was at Mac to explain the research objectives of the Bureau and how they fit in with those of the Faculty, in view of the fact that the Bureau has recently undertaken to establish a Dairy Chemistry Research Laboratory on Campus in collaboration with the Department of Agricultural Chemistry and Physics. One of the main interests of the Bureau at present is the investigation of dairy products as related to medical and paramedical applications. There is already one research project underway, involving a Ph.D. student under the supervision of Drs. Bruce Baker and Guy Paquette, of the above mentioned Department. In the near future there is expected to be a strong interaction with many other units of the Faculty: Animal Science (DHAS program), Food Science (Nutrition and sensory evaluation), Microbiology (fermentation), etc. A wine and cheese gathering followed Dr. Amer's presentation and some of the participants are still wondering how wine got to be classified as a dairy product!

P.S.

A Joy to Read

Congratulations on the new format of the Macdonald Journal. It's beautiful and a joy to read. Several members have mentioned what an improvement it is.

M. Palmquist,
 Ayer's Cliff, Que.

Required Reading

I wish to congratulate you for the quality of the November '82 Journal which in my opinion is the best individual issue of the Journal as to both content and presentation which I have received in my nearly 20 years at Macdonald.

Of special interest were the two articles from the agribusiness section contributed by Mr. Beeler of Oshawa, Geigy and Mr. Swail of Ralston Purina who, I believe, had an important message to transmit to post secondary agricultural teaching institutions. It is my fervent wish that the academic leaders of our community take time to read and re-read both of these articles and allow some of the thoughts expressed in them to be absorbed in their thinking when planning future curriculum changes within our Faculty.

Over the last 17 years I have personally been involved in employing many technical graduates of several agricultural teaching institutions to work in the agribusiness sector, specifically in dairy extension. In too many cases I have experienced disappointment and frustration from interviewing candidates who possess an excellent practical background, or the "art" of agriculture, as Mr. Beeler refers to it, who seem to be excellently equipped with technical and scientific knowledge but who either fail to demonstrate the degree of dedication and desire required to survive in the marketplace or do not possess sufficient communication skills to be effective and productive employees.

I firmly believe that teaching institutions could and should attempt to address these problems.

Again, Hazel, congratulations on

lent Journal, and I look forward
ure issues.

Campbell,
ral Manager, DHAS

Is It On

by the Mac Journal so much as I
a graduate in Education. I send it
our daughter in Martintown who
Home Economics graduate and
is also an enthusiastic WI
ber.

Chas. Reid,
ingdon, Que.

Look

ratulations on the "new look" of
ournal — although I miss Journal
ngs.

Clark,
ynsburg, Que.

standing

and the last issue! The new format
o outstanding! I did want to send
congratulations.

hampion,
ria, B.C.

gratulations

gratulations on the "new" Mac-
ald Journal.

n Kennedy, B.Sc. (Agr.) '65, M.Sc.
) '70
lph, Ont.

e to Catch Up on News

ing from the contents of the Jour-
you are keeping up the good work.
always nice to catch up on news
n Macdonald.

Weaver, B.Sc. (Agr.) '80
nipeg, Man.

sends us news of some Winnipeg Wildlifers
ee Newsmakers.)

rp, Neat, and Informative

ongratulate you on the new ap-
rance of the Journal and for the
tent change which you have
ught about. The whole image is
rp, neat, and informative.
Best wishes for your continued
cess.

ron E. Beeler, B.Sc. (Agr.) '58
ecutive Vice-President Ciba Geigy,
sa Craig, Ont.



The above photographs show the Agri-Winch, an easily operated and versatile skidding unit, being used in the Morgan Arboretum. It is in the Arboretum for both testing and demonstration.

THE AGRI-WINCH

by Professor J.D. MacArthur
Department of Renewable Resources

The Agri-Winch provides woodlot owners with an effective and relatively low cost means of skidding large or small timber in woodlot harvesting operations. In combination with a farm tractor the Agri-Winch creates an easily-operated and versatile skidding unit which is particularly suited by size and design to woodlot harvesting.

The Agri-Winch fits the three-point tractor hitch and the mechanical winch operates off the tractor PTO. The 100-foot main cable with six chokers permit the winching in of logs or tree lengths. From one to several pieces may be winched at one time. Damage to most trees can be kept to a minimum by careful positioning of the tractor in relation to the timber to be moved. With the winch in neutral it is easy for the operator to pull the cable out to the logs that are to be winched in while leaving the tractor on the trail or road.

When the load has been winched in it is raised by the winch to rest against the butt plate of the winch unit. The weight of the load at this point rests partly on the wheels of the Agri-Winch and partly on the ground. There is no weight on the tractor. The tractor can now move off with the load to the place where the timber is being processed and piled. Only the smaller ends of the pieces in the load drag on the ground and there is little effect on trails and roads, even under urban operating conditions on unfrozen ground.

Advantages offered by the Agri-Winch are: low capital cost, ease of maintenance and operation, and ability to extract timber with little disturbance of stands and sites.

The Agri-Winch was developed by a Quebec inventor with assistance from the Forest Engineering Research Institute of Canada. The unit pictured here has been made available on loan to the Morgan Arboretum by the Quebec distributor, Forano AG. inc., for testing and demonstration. Results to date in skidding large sugar maple and elm logs in selection harvesting have been excellent.

Information on the Agri-Winch may be obtained from: Mr. Y. Laliberté, c/o Forano AG. inc., 1495 Ste-Anne, Plessisville, Qué. G6L 3N4 (tel. 819-362-7395).

FOUNDATION SCHOLAR

In 1975 the Rotary Club of Montreal created a Foundation dedicated to the betterment of living in the developing countries through applied research in



the field of agriculture. Since 1975 three students have benefited from the Foundation.

Pedro F. Benoit of Santiago, Dominican Republic, the third Foundation scholar, came to the Faculty of Agriculture of McGill University in 1980 to obtain an M.Sc. in Agriculture. His research on the "Evaluation of Seedling Resistance of Eight Dry Bean Cultivars to Four Isolates of *Xanthomonas Phaseoli* in the Dominican Republic" is supervised by Dr. Katrine Stewart of the Department of Plant Science and Dr. Frederico Cuevas Berez of Instituto Superior de Agricultura (ISA) of Santiago, Dominican Republic. Pedro's research is concerned with one of the most devastating diseases of *Phaseolus* beans. Beans are a very high profile crop in Latin America. They are the major protein source for the rural populations and for the poor urban population. Pedro's ultimate objective is to identify disease resistant materials which can be used either directly by the farmer or to provide the base for a breeding program to produce disease resistant cultivars. Following completion of his field work in Dominican Republic, he will return to Macdonald to defend his M.Sc. thesis. He will then go back to his homeland where he will work on some of his country's agricultural problems.



At the recent Scholastic Awards Banquet Deschamps, B.Sc. (Agr.) '80 presented Ralston Purina Scholarship to Robert Borczyk, third year Environmental Biology student from Chambly.



The Ross Preston Bursary provided by Champlain Industries Limited was presented by Mr. Bernardin Côté to Helena Rozankovic, a third year Food Science student from Rosemère.



Mr. Allen Weigensberg presented the Modern Drainage Systems Prize to Richard Brunk, a third year Agricultural Engineering student from St. Lawrence.

Agribusiness Awards

by Professor R.S. Broughton
Chairman, Scholarships Committee

One of the good things which happens due to friendly relations between persons in agribusiness and the Faculty of Agriculture is the Provision of scholarships and prizes by industries for students who achieve high academic standing and who participate in sports or campus organizations.

Scholarships provided by companies serve several important purposes:

1. The student receives some financial compensation for his or her academic achievements.
2. Merit and effort are recognized.
3. The students see that the companies which employ graduates are interested in students who are achievers and workers.
4. The students get an indication of the

kinds of companies which are interested in them as students and as graduates.

5. The companies who provide scholarships get some publicity in the University announcements and at the annual awards presentations.

6. At the awards presentations the representatives of the companies make contact with students and staff members from several disciplines.

The companies who provide scholarships or prizes in the Faculty of Agriculture at the present time are:

Ketchum Manufacturing Sales Ltd., Ottawa, Ontario
Goodhost Foods Ltd.
E.D. Food Ltd.
Meade Johnson Canada Ltd.
Modern Drainage Systems Inc.
Genstar Chemical Ltd.
The Atlantic Provinces Hatchery Association

The Ralston Purina Co. Ltd.
The Food and Nutrition Research Foundation
Champlain Industries Ltd.
John Deere Co. Ltd.
L'Association des Fabricants d'Engrais du Québec
The Chemical Institute of Canada
The Hubbard Farms

newsmakers

f campus

ERNEST KERR, M.Sc. (Agr.) '41, is fully retired from the Simcoe Agricultural Experiment Station, but contributions to agriculture will not be forgotten. He established a nationwide reputation as a vegetable breeder during his 38-year career with the Ontario Ministry of Agriculture and Food. Over the years he has developed more than 50 varieties of tomatoes and sweet corn. Kerr-developed varieties are being grown in seven provinces. In 1980 he was presented with the "Man of the Year" award by the Canadian Seed Trade Association as the first horticulturist to receive the honour.

MURRAY ELLIOT, B.Sc. (Agr.) '49, is a professor in the New York State College of Agriculture and Life Sciences at Cornell, was cited for his outstanding ability as an undergraduate teacher of dairy science. Besides his teaching duties involving basic courses in animal science, Elliot has conducted research dealing with the nutrition of dairy cows, focusing on the glucose needs of the lactating cow and vitamin B₁₂ nutrition of the ruminant. A native of Howick, N.Y., Elliot received the B.Sc. '49 from McGill University, the M.Sc. '51 from the University of Vermont, and the Ph.D. '58 from Cornell.

WEN CAMPBELL, B.Sc. (Agr.) '50, has been appointed potato specialist in the Provincial Agriculture Department of Prince Edward Island. She is a native of P.E.I., and has served the federal government in potato production and seed certification programs for more than 15 years.

HERMAN L. McEWEN, B.Sc. (Agr.) '51, Professor of Environmental Biology, has been named the next chairman of the renowned Ontario Agricultural College at the University of Guelph. Professor McEwen has been Chairman of the Department of Environmental Biology from 1971 to 1982. He has also been provincial entomologist for eight years and is currently acting director of the proposed Canadian Centre of Entomology.

RUSSELL F. DUCKWORTH, B.Sc. (Agr.) '51, has been appointed group vice-president operations for United Co-operatives of Ontario. He is responsible for the operating units of crops, energy, feed, grain, livestock, and poultry.

DIANE CHARETTE, B.Sc. (F. Sc.) '81, has been promoted to Assistant Product Manager for Henry Galler — Hitachi Canada. She is in charge of their microwave ovens and appliances and recently made a trip to Japan to visit the head office.

Winnipeg Wildlifers

Patt Weaver, B.Sc. (Agr.) '80, has started on her M.Sc. at the University of Manitoba. Her thesis topic is Population Structure and Reproductive Biology of Caribou, Cape Churchill, Manitoba. "My Christmas holidays will be spent on a compulsory field trip at Dr. Pruitt's field station about 230 km northeast of here (Winnipeg). I'm off to Churchill in January to talk to the hunters and maybe go on a hunt, although I don't think they'll be too enthusiastic about taking me along! Have another full slate of courses next term. Hope to start the project in March, which means ground surveys in late May and June, aerial surveys, examination of reproductive tracts...augh!" Bill Chappell, B.Sc. (Agr.) '76, M.Sc. (Agr.) '82, has just finished a contract with the Canadian Wildlife Service. Heidi Juul, B.Sc. (Agr.) '79, is working in the soils department at the University of Manitoba, Steve Tinker, B.Sc. (Agr.) '76, M.Sc. (Agr.)

'81, is with Fisheries and Oceans doing aerial photography analysis of their whale survey, and Joanne Barbeau, who started her degree at Mac, is planning a move to Winnipeg.

on campus

DR. SHERMAN TOUCHBURN, of the Department of Animal Science, was recently appointed as Associate Director of the McGill Centre for Nutrition and Food Science. The Director of the Centre, which was established in 1980, is Dr. Errol B. Marliss. The goals of the Centre are to coordinate the relevant activities of the Faculty of Agriculture, the Faculty of Medicine, the McGill complex of teaching hospitals, and other concerned faculties. Through its coordinating role, it is hoped that this Centre will promote the development of fundamental research in nutrition and food science; the post-graduate training of nutritionists in the University; the teaching of nutrition and food science to undergraduate students, including those in the Faculty of Medicine, and the rapid dissemination of information to all nutrition and food science professionals both within the University and the community at large.

THE DEPARTMENT OF ENTOMOLOGY was well represented at the recent (November 29—December 3) Joint Meeting of the Entomological Society of America, Canada, and Ontario. Eight graduate students presented papers. Former students contacted at the meeting included: Bruce Broadbent, Arnie Dyck, K.P. Lim. All looked as if life was treating them well.



At a Lyman Entomological Museum pub-lunch held at the home of D. Keith Kevan in November, three Gold Medallists of the Entomological Society of Canada (the only institution to have so many!) were, left to right, the host and Museum Director, (medallist 1981) Eugene G. Munroe (Hon. Research Associate, medallist 1982), J. Anthony Downes (Hon. Research Associate, medallist 1977). The three were the instigators of the now thriving Biological Survey of Canada.

deceased

DAVID LIVINGSTONE MACFARLANE (1909-1982)

David Livingstone MacFarlane, Emeritus Professor, died on November 24, 1982, at the Royal Victoria Hospital at the age of 73. He had earlier undergone heart surgery from which he never fully recovered.

Born and raised in rural Saskatchewan, Professor MacFarlane received his B.S.A. and M.Sc. from the University of Saskatchewan, followed by a Ph.D. in Economics from the University of Minnesota. He also pursued post-doctoral studies at Harvard and the University of Chicago.

Prior to joining the academic staff of McGill University, Professor MacFarlane was first an Assistant Professor at the University of Kentucky from 1938 to 1942 where his research was sponsored by the Rockefeller Foundation. He then joined the Food Administration Council in Ottawa as economist responsible for prices and trade during the critical war years. Following the war he again returned to the United States where he spent three years in Washington as director of purchasing of dairy and animal products at the United Nations.

D.L. MacFarlane joined the Department of Agricultural Economics in 1947 and held the position of Chairman in that Department for a period of 27 years until his retirement in 1974. During that time he served on a number of federal and provincial

commissions. Foremost among these was the Federal Task Force on Agriculture on which he acted as Chairman from 1967 to 1969, at which time the Task Force presented its report entitled "Canadian Agriculture in the Seventies." This 475-page report is one of the most comprehensive documents ever compiled on Canadian Agriculture and contained numerous recommendations for agricultural policy as the industry emerged from very depressed conditions which prevailed in the late 1960s.

Professor MacFarlane served Canadian agriculture in many other capacities. He was Economic Advisor to the Quebec Agricultural Marketing Board from 1956 to 1963; he was also a member of the research committee of the Cooperative Union of Canada from 1957 to 1963; he served as consultant to the Parliamentary Commission on Farm Machinery prices and to the MacPherson Royal Commission on Transportation in 1961.

Professor MacFarlane became involved in economic development in a very active way in the 1960s. While serving as visiting professor to the University of Nigeria from 1963 to 1965 he was instrumental in founding the Economic Development Institute in that country. He returned to Nigeria for

shorter periods in 1970 and 1971. Professor MacFarlane also carried out development projects in Mali (1970) and Afghanistan (1972) on behalf of the World Bank. He remained active in the field of development during his post-retirement years, reflecting his commitment to the alleviation of poverty in the Third World.

At McGill University, Professor MacFarlane enjoyed a kind of "citizenship" working closely with the Department of Economics on the downtown Campus while teaching and serving as Chairman in Agricultural Economics on the Macdonald Campus.

Professor MacFarlane was a man of deep convictions and never hesitated to express them forcefully and to fight for them with all his energies. Coupled with his interest and expertise in public affairs, these qualities enabled him to be very influential in areas of public policy — both within Canada and in the world at large. He has left his mark in other ways as well. As author or co-author of some 60 books, monographs, and research papers, he contributed substantially to the body of literature produced by his profession. His research activities and contacts with other leaders, both nationally and internationally, during his years at McGill have not only advanced the progress of agricultural development but have also carried the name and reputation of this University to the corners of the world.

Heartfelt sympathy is extended to his sons, Donald, Bruce, Matthew, and Neil, and their families.

ROSS A. HENNIGAR

Former classmates and friends in the Macdonald community and elsewhere were saddened by the tragic death on January 11, 1983, of Ross Hennigar, B.Sc. (Agr.) '51. Mr. Hennigar, who was President, Chief Executive Officer, and Director of Suncor Inc., and four others were killed when their corporate jet, which was coming into land at Toronto International Airport, crashed.

As well as being an outstanding business leader and a dedicated family man, he was a contributor to his community: he was President for the Greater Toronto Region of the Boy Scouts of Canada, a Director of the Ontario Chamber of Commerce, the Toronto Board of Trade, and the

Rousseau Lake School.

Professor Pierre Jutras of the Department of Agricultural Engineering was a classmate of Mr. Hennigar's and knew him as a natural leader, serving as President of the Literary and Debating Society and of the Rural Problems Club. He was also on the Students' Council.

After Macdonald, Ross Hennigar worked for the United Co-ops of Ontario and Maple Leaf Mills. He was a Director of Employee Relations prior to being named President of Suncor Inc.

His wife Nancy (Stephens) also attended Macdonald (B.Sc. [H. Ec.] '52); to her and their children Cathy, Robert, and John, the Macdonald community offers sincere sympathy.

WILLIAM JOHN REID, M.B.E., B.S.A. '11. Member of first graduating class. CASPER W. OWEN, B.S.A. '25. Harrow, Ont., on February 18, 1981. WILLIAM POPP, M.Sc. (Agr.) '26. Winnipeg, Man. R.P. LONGLEY, B.S.A. '30, at Kentville, N.S., on September 11, 1981. COLLIN DUNCAN TAFT CAMERON, B.S.A. '32, M.Sc. (Agr.) '36, at Laval, Que., on September 15, 1981. JACK G. STOTHART, B.S.A. '32, M.Sc. (Agr.) '36, in Alberta on August 1, 1982. PAUL E.R. BOVELL, B.S.A. '34. Burnaby, B.C., on October 26, 1981. R. ALAN HAY, Dip-Agr. '48. Prescott, Ont., in June 1981. RALPH R. CRAIG, Dip-Agr. '53. Lacombe, Alta., on August 17, 1981.